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In This Issue

The Railway Age is indexed by the Industrial Arts Index and also by the Engineering Index Service

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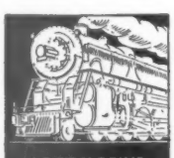

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RAILWAY AGE

The "Class Struggle" and Capitalism

Almost every civilized country in the world is being torn by a struggle between those who favor capitalism and those who favor socialism. Many who are fighting for one or the other do not know it, but this does not alter the fact.

The establishment of Communism in Russia was the result of triumph of a small organized group of the "proletariat" who had long sought to destroy private property by violence and replace it with the Marxist system of government ownership and management of all means of production and distribution. The establishment of Fascism and Naziism in Italy and Germany was the result of struggles between the working class, or "proletariat," which was seeking to undermine and destroy private property, and the middle class, which successfully resisted the effort by force. The civil war in Spain is fundamentally a struggle between the class that is trying to destroy capitalism (private ownership and management of property) and the class that is trying to maintain it. The success of the socialists in the last election in France threatens that country with civil war. The purpose of their avowed policies is to undermine and destroy private property. If real efforts are made to do this they are almost certain to be resisted by force, because in no country will the middle class, even if out-voted at the polls, submit peacefully to confiscation of its income and property.

The "Class Struggle" in the United States

Radicals, on the one hand, including most labor union leaders, and most business men, large and small, on the other hand, instinctively recognize that the political campaign in the United States this year is approximating a "class struggle" between those favoring capitalism and socialism, and are lining up accordingly. Anyone who would predict now that the realignment of membership in political parties would continue until virtually all the working class would be arrayed on one side and virtually all the middle class on the other, and that this would cause civil strife resulting finally in the establishment of a socialist or Fascist dictatorship in this country, probably would be called mildly insane. But it is plain that such a political realignment is under way; and efforts are being made to complete it.

Most radicals, including most leaders of labor unions, are openly supporting the candidates of one political party in the present campaign; and they are announcing plans for putting a "labor" party in the field in 1940. Their evident purpose is to array all who believe they would be benefited by socialistic policies on one side. The objective is control of the government as the essential means of adopting and carrying out socialistic policies. Success of efforts to array all who believe they would be benefited by socialistic policies on one side would inevitably tend to array all who believe they would be injured by such policies on the other side. Thus, the "class struggle" which has been going on for years in most civilized countries would be transferred to the United States, and probably in due course would cause the same dire results—including, perhaps, a dictatorship representing one side or the other.

Education Needed Regarding Capitalism

No American citizen not blinded by prejudice or motivated by some unpatriotic ambition can regard this prospect without abhorrence. How can its fulfillment be avoided? Perhaps only, if at all, by systematic and thorough economic education of every class of the American people that is educable. There are at present in this country numerous individuals who understand the capitalistic system and how it must be operated to make it produce the best results for all the people; but there is *no* entire class of the people of whom this is true. Propaganda against and for it is being poured from many sources. Whatever the source, practically all of this propaganda is strongly colored by class or individual prejudice, and is intended to defend or promote policies which those from whom it emanates believe will further their selfish interests at the expense of others. This is as true of most propaganda emanating from business and anti-New Deal sources as of

most propaganda emanating from labor, radical and pro-New Deal sources.

There is needed a systematic and thorough campaign which will educate all classes—business men, professional men, farmers, workingmen, "white collar" and otherwise—regarding what capitalism is, how it has functioned, what good results it has produced, why it has at times produced bad results, what should be done to make it produce better results in future. Radicals have been describing capitalism, its functioning and its results in their own way for many years. The education in economics they have thus given many people, especially the working class, has prepared these people to believe the worst of capitalism, especially in every period of depression.

While radicals in this country have been for many years pouring forth vast quantities of literature attacking capitalism, leaders in finance and business, and most members of the middle class, have been smugly regarding them and their efforts with contempt, and devoting themselves energetically and almost exclusively to trying to increase their wealth and incomes. Hence the present prevalence of socialistic sentiment and socialistic government policies.

Bad Functioning of Capitalism

Capitalism is either more or less in the interest of a large majority of the people than socialism would be. If it is not in their interest, it should be destroyed. If it is in their interest, it should be and can be intelligently and successfully defended. But it has functioned many times and in many ways which cannot be honestly defended by many of those who believe in it as both theoretically and practically the best available economic system. This is proved, if conclusive proof were needed, by the present depression, which no fair critic of the New Deal can fail to recall began, reached bottom and lasted over three years before the New Deal began.

Most criticisms of capitalism imply that it so functions that in periods of depression as well as prosperity it continuously produces profits for owners of capital, and that it is only the propertyless class who suffer in periods of depression. The facts are quite different, and demonstrate that owners of property, large and small, should in their own selfish interest be quite as anxious as the propertyless for the adoption of policies, whether of government, or business, or both, that will at least tend to make capitalism function efficiently.

The Department of Commerce recently issued an announcement giving detailed estimates of the aggregate income *produced* and *paid out* in each year including and since 1929, together with certain other details. Its estimates were reproduced in the bulletin of the National City Bank of New York for August, 1936, without criticism, and may therefore be assumed to be approximately correct. The estimates are given in a table herewith. Income "produced" and "paid out" are two entirely different things, as the figures show. The national income produced in 1929 exceeded by $2,402,000,000 the national income paid out. The excess of income produced over income paid out was divided between savings made by corporations of $1,423,000,000, and by individuals of $979,000,000.

National Income Produced And Paid Out
(in Millions of Dollars)

Item	1929	1930	1931	1932	1933	1934	1935
Income produced	81,034	67,917	53,584	39,545	41,742	48,397	52,959
Total savings	2,402	−5,015	−8,120	−8,817	−3,198	−1,776	−628
Corporate savings ...	1,423	−3,909	−5,877	−6,366	−2,796	−2,340	−1,443
Business savings of individuals	979	−1,106	−2,243	−2,451	−402	563	815
Income paid out.....	78,632	72,932	61,704	48,362	44,940	50,174	53,587

Business Loses 32 Billion Dollars

Consider the very different figures for the depression years 1930-1935, inclusive. During these six years the corporations of the country as a whole paid out $27,564,000,000 *more* than they earned and individuals in business paid out $4,824,000,000 more than they took in, an aggregate loss for corporations and individual business men of $32,388,000,000. Of course, these losses were paid from reserves derived from income produced exceeding income paid out in previous years. Can anybody study these figures without concluding that there was something, or many things, terribly wrong with the way capitalism functioned both before and during the depression? Can anybody study them without realizing that it functioned as badly for property owners—i.e., capitalists—as for the propertyless, and that its functioning needed reform and improvement as much in the interest of the former as of the latter? The *Railway Age* is as much opposed to the principal policies of the New Deal as any publication; but it accepts the plain fact demonstrated by these statistics that capitalism under the Old Deal had something or many things radically wrong with it that helped to cause the worst depression in history, and that opponents of the New Deal have another duty to perform quite as important as that of opposing the New Deal. This is, not only to defend capitalism, but to help make it more defensible.

How Make Capitalism Defensible?

How, then, first, make capitalism fully defensible, and, second, effectively defend it?

The way to do both has been indicated by the Brookings Institution of Washington, D. C. This is an expert, independent and important economic research organization. Its monumental work on the present depression consists of four volumes entitled "America's Capacity to Produce," "America's Capacity to Consume," "Formation of Capital" and "Income and Economic Progress." Both New Dealers and anti-New Dealers have derived comfort and quoted extensively from it, because it showed (1) how faults in the functioning of capitalism did help to cause the depression, and (2) why socialistic policies of the New Deal would not make its functioning better but worse, and there-

force would tend to perpetuate depression. It rendered the great service of ascertaining *facts* by comprehensive research, and of drawing from these facts *conclusions* as to what changes in the structure and functioning of capitalism have been and still are needed to make it produce much better results for a vast majority of the people.

Now, this is what capitalism most needs—the ascertainment of all the *facts* regarding its structure, functioning and results, and the drawing of logical *conclusions* from these facts *by authoritative and absolutely impartial economists*. But this ascertainment of facts, reasoning from them and presentation of facts and conclusions should not be only occasional. It should be continuous, in periods of good as well as poor business—in periods when business is good to warn against influences and trends tending to cause it to become bad; in periods when business is poor, to stimulate influences and trends tending to revive it.

Those doing the work of ascertaining the facts and drawing the conclusions to be disseminated should be absolutely untrammeled by any governmental, business or other hampering or vitiating influence. If the work were done or influenced by government, each administration would try to have it show that its policies were a success. If it were done on behalf of any particular industry or group of industries, they would try to have it show how the economic system should be operated more in their interest.

The purpose of the work should be to promote the maximum well-balanced production of all useful commodities and such distribution of income as would foster such maximum well-balanced production. It would cost a large amount continuously to conduct the necessary research and disseminate its results. The money required should be furnished by all the private industries of the country, because the work would be of incalculable value to them. The information would help business men to manage capitalism much better, assuming they would be wise enough to use it, and would thereby make capitalism more defensible; and it would afford the most effective possible ammunition with which to defend it.

Who Would Defend Capitalism?

But who would actually use the ammunition after it was available? For it would have to be so used as to educate all the educable people of the country if it were to prove an effective antidote to the propaganda against capitalism. And here we encounter an amazing fact. Probably there are ordinarily ten popular writers and public speakers attacking capitalism to one who is defending it; and the former usually try to reach the "masses" with their propaganda, while the latter usually try to reach the "classes" with theirs. Is there any reason then, why we should so often be astonished, especially in periods of depression, by the amount of socialistic sentiment that can be arrayed in support of legislation tending to destroy capitalism? The enemies of capitalism war against it all the time. Most of its defenders take the trouble to defend it only at intervals when the noise of the attack outside their offices and plants becomes so loud as briefly to divert them from their desks, operating statistics and push-buttons.

If the "class struggle" is to be avoided in the United States, probably if capitalism is to be preserved, capitalism must be so reformed that it will function much better than in the past—more efficiently than any other system could in promoting the welfare of all the people; and it will have to be defended much more intelligently, energetically, and continuously, and by a great many more writers and speakers of popular appeal, than it has been in the past. It is plainly the responsibility of leaders in finance, industry, transportation and agriculture to cause these things to be done—their responsibility, first, to the people of the country, and, second, to the investors who have entrusted them with the management and protection of their investments. It is not the function of a financial or business leader merely to make a "record" he can show to his stockholders in comparison with "records" made by competitors who may be merely more incompetent than he is. Such "leaders" of capitalism are blind leaders of the blind, and under such leadership capitalism and all who have a stake in it would finally and irretrievably land in the ditch. It was under such leadership that corporations and individual business men lost over $32,000,000,000 in 1930-1935.

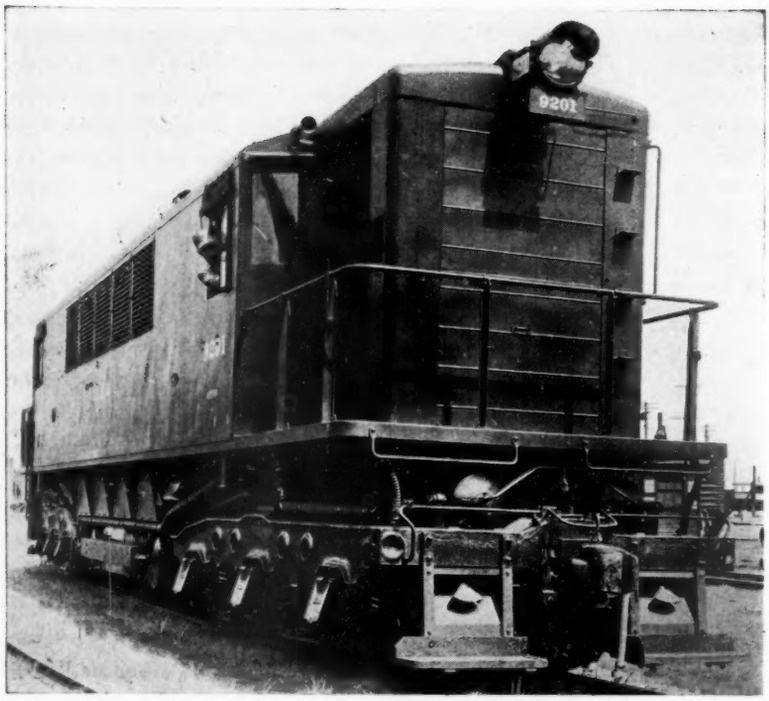
Dr. H. G. Moulton, president of the Brookings Institution, has said, "The trouble with capitalism is the capitalist." We infer that what he meant is that the trouble is not with the system, but with those who run it, and often run it badly; make no efforts to reform and improve it that they fear might be contrary, even temporarily, to their own supposed selfish interests; and do nothing when it is attacked but complain because it is attacked. The country is full of that kind of capitalists. They helped to cause this and previous depressions. They are a much greater menace to capitalism than the agitators for socialistic policies.

Why Re-employment Lags

No nation has made a bolder or more heroic effort to increase employment than has the United States during the last three years, and yet the effort has yielded disappointing results. The procedure which has been followed has been that of raising wages in the hope that this would increase consumer purchasing power and provide markets for more production. This policy was the essence of the NRA. Stripped of all phraseology about consumer purchasing power, the procedure simply amounted to an attempt to sell more labor by increasing the price of labor! . . .

Our common sense should have warned us that raising the price is not likely to increase the sales of any article and that there is no reason to expect labor to be different in this respect from all other articles. It is not likely to be the one and only thing which can be sold in greater volume by increasing the price.

Professor Sumner H. Slichter in the September "Atlantic Monthly"



Illinois Central Gets Powerful Switcher

Largest single-unit Diesel-electric locomotive of this type will develop 2,000 horsepower

THE Illinois Central has recently placed in heavy freight transfer switching service at Chicago the most powerful single-unit Diesel-electric locomotive so far constructed in this country. This locomotive, built for the Busch-Sulzer Bros. Diesel Engine Company, St. Louis, Mo., by the General Electric Company at Erie, Pa., is designed to combine a high degree of simplicity, rugged construction and ease of maintenance, with ample capacity, both mechanical and electrical, to assure reliable performance in the service assigned. It develops 2,000 hp. and weighs 173 tons.

Principal Features of the Diesel Driving Engine

The heart of the locomotive is the new Busch Sulzer, two-cycle, 10-cylinder, V-type Diesel engine which is conservatively rated at 2,000 brake horsepower at 550 r.p.m. in continuous service. The principal dimensions of the engine are shown in one of the tables.

As the service for which the locomotive is intended demands a high starting tractive force, it was found that an engine weight of 36 lb. per brake hp. could be employed to advantage. The same engine can be built with a weight of 23 lb. per hp. where service conditions necessitate lower weight.

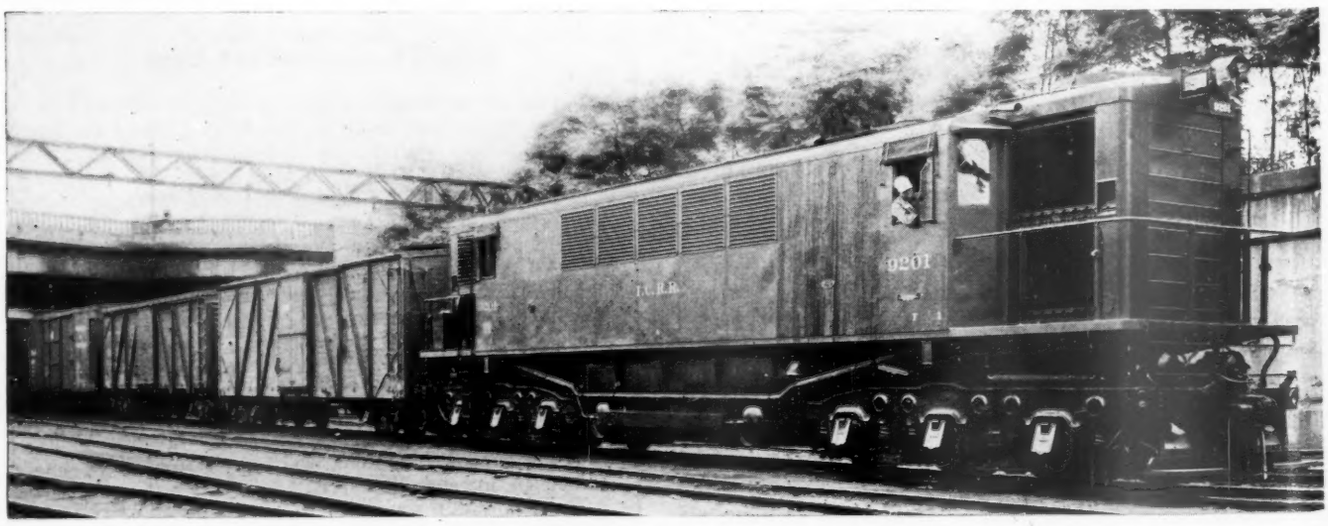
The engine is of the single-acting mechanical injection trunk-piston type, having 10 working cylinders arranged in two banks of 5 cylinders each, operating on the Diesel cycle. The angle of the vee between the cylinder banks is 45 deg.

Scavenging air is supplied by gear-driven Roots-type rotary positive-displacement blowers which are mounted across the top of the vee between the two banks of cylinders. The blower housings act as covers and the vee is thus utilized as the receiver for the scavenging air.

The engine is started by applying power from the locomotive storage batteries to the generator attached to the engine crankshaft. During the starting period, the generator, therefore, acts as a starting motor.

The fuel measuring pumps and the governor and control mechanism are mounted in a housing extending across the end of the engine farthest from the barring wheel and generator. The pumps are driven by gears and a vertical shaft from the end of the engine crankshaft.

Pistons are made of cast aluminum. The wristpin



Diesel-Electric Switcher Built by General Electric for the Illinois Central Which is Powered by a 10-Cylinder Busch-Sulzer Engine

bearing is provided in a separate housing which is inserted into the piston from below. The piston skirt is, therefore, not pierced by the wristpin, resulting in a construction that permits full freedom for expansion.

The design of the working cylinders incorporates the use of an upper and a lower cylinder liner, the upper liner containing the scavenging and exhaust ports. The lower cylinder liner is inserted into the engine frame from the inside of the crankcase. Both of these liners extend into a so-called "sludge chamber," there being a gap between the ends of the liners which permits unobstructed inspection of the piston while the engine is running. Cylinder liners are made of a special alloy cast iron. The upper liners are fastened only at their upper flanges, thus providing full freedom for expansion. The lower liners are fastened only at their lower flanges, thus providing also full freedom for expansion.

The engine frame is made of cast iron and includes the crankcase with cross girders and bearing saddles, as well as the cylinder jackets for both banks of cylinders.

Special alloy-steel bolts and studs are used where required by stress conditions. The materials used in the construction of fuel pump parts, fuel valves, etc., are especially selected to minimize wear and breakage.

All engine bearings, gears and control mechanism are pressure-lubricated. The engine control servomotor and the governor relay are also operated by pressure oil from the main lubricating oil header. The engine controls are, therefore, arranged so that the engine cannot be started, or operated, on fuel unless a minimum pressure of 12 lb. per sq. in. is registered in the pressure lubricating system.

If the pressure in the system drops below 12 lb. per sq. in., due to a break in a main feed line, loss of oil in the system, or sticking open of a relief valve, the engine will immediately be shut down. The engine cannot be re-started on fuel unless the cause for the pressure drop is determined and corrected and the pressure brought up to the minimum of 12 lb. per sq. in.

Engine Speed Control—Starting and Shut Down Devices

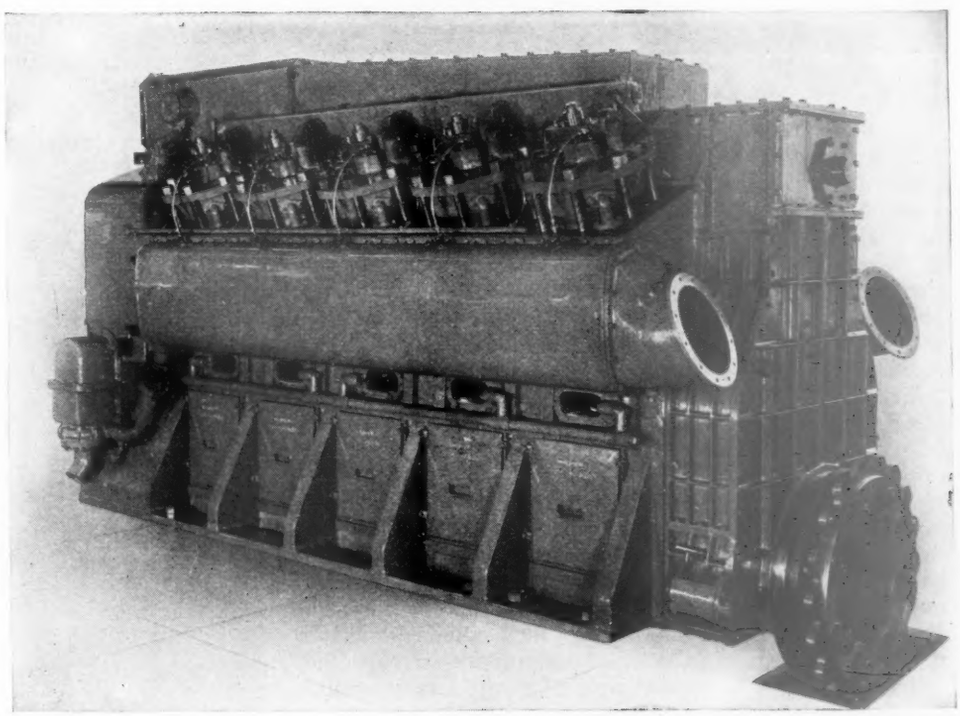
The speed of the engine is regulated by a variable-speed governor which is adjusted to control the operation of the engine within the range from 275 r.p.m., idling speed, to 550 r.p.m., maximum speed. The engine may be operated at any desired speed within these limits.

An overspeed safety governor is also provided. This unit functions entirely independent of the main variable-speed governor and is set to prevent the engine speed from increasing more than 10 per cent above its maximum speed of 550 r.p.m. If the engine speeds up to a point higher than approximately 605 r.p.m., it will, therefore, automatically be shut down and re-starting will not be possible until the overspeed cut-out mechanism has been re-set, which can only be done at the engine.

Working Principle—Method of Operation

The control lever, located at the fuel-pump end of the engine, is used when starting the engine and can also be used for stopping it. A pneumatically operated shut-down device is also provided which is operated from the control station in the operating compartment of the locomotive. The engine cannot be started from the engineer's cab; this can only be done by operating the main hand-control lever located at the forward end of the engine.

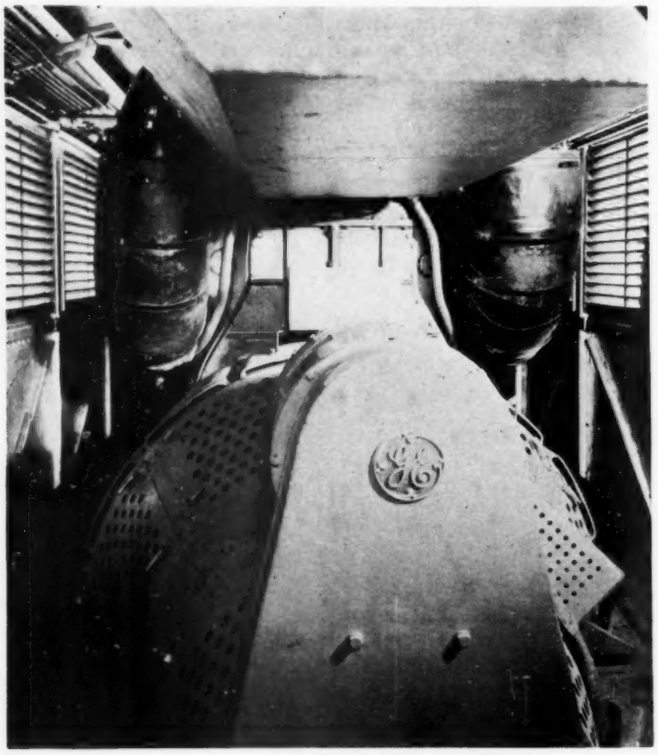
The crankcase and the sludge chambers of the engine are ventilated through ducts which are connected to the suction side of the scavenging blower air intake. Two separate ducts are provided, one for crankcase ventilation and one for sludge chamber ventilation. Each of these ducts, or suction lines, is provided with a centrifugal oil separator, which is located near the suction intake of the blower.



General View of the Busch-Sulzer 2,000 Brake Hp. Diesel Engine

During the first few revolutions of the engine in starting, the compression in the cylinders is relieved, but as soon as the engine picks up sufficient speed, the compression-relief gear is cut out and fuel is supplied to the engine. When the cylinders commence firing, the power from the storage battery is shut off. The engine controls are designed so that it is impossible to start the engine on fuel unless the pressure in the pressure lubricating oil system is at least 12 lb. per sq. in. It is, therefore, necessary to operate the motor-driven lubricating oil priming pump before starting the engine.

In a Diesel engine, air is compressed in the working



The Generator End of the Engine

cylinder on the upstroke or compression stroke of the piston to about 500 lb. per sq. in. pressure. The temperature of the air, after compression to this pressure, is high enough to ignite the finely atomized fuel which is injected into the combustion space shortly before the piston reaches upper dead-center. The fuel is injected into the cylinder by means of a timed fuel-measuring pump which forces the fuel oil through an atomizing nozzle.

Scavenging, i.e., the purging of the working cylinder after combustion of the fuel, is effected through two rows of ports in the cylinder walls which are located on the opposite side from the exhaust ports. The ports in the upper row are controlled by automatic valves which do not open until the pressure within the cylinder has dropped close to atmospheric pressure after the piston has uncovered the exhaust ports. The scavenging air expels the burned gases and fills the cylinder with fresh air at a pressure slightly higher than atmospheric, so that, at the beginning of the compression stroke, the cylinder contains a greater weight of air than it would contain at atmospheric pressure.

The cycle of operation in the cylinder is completed in two strokes of the piston or one revolution of the crankshaft. Fuel is injected into the cylinder by the fuel-measuring pump, beginning about 36 deg. before the piston reaches upper dead-center. The finely atomized fuel is ignited in the hot compressed air and the gases thus formed drive the piston downward.

Near the end of the down stroke (expansion stroke), the exhaust ports are uncovered by the piston, the burnt gases escape through these ports and the pressure drops to about atmospheric. At this point, the upper row of scavenging ports has already been uncovered by the piston, the automatic valves controlling the ports are opened and scavenging begins. When the lower scavenging ports are uncovered, additional scavenging is obtained and the cylinder is completely scavenged.

During the following up stroke of the piston, scavenging and the charging continue until the piston covers the exhaust ports. From this point, until the piston covers the upper scavenging ports, the cylinder is being supercharged, so that, when the piston does cover the upper scavenging ports, the pressure of the charge within the cylinder is about equal to that of the scavenging air supply. Compression begins as soon as the piston covers the upper scavenging ports. Fuel injection begins slightly before the upper dead-center, as stated, and the cycle is repeated.

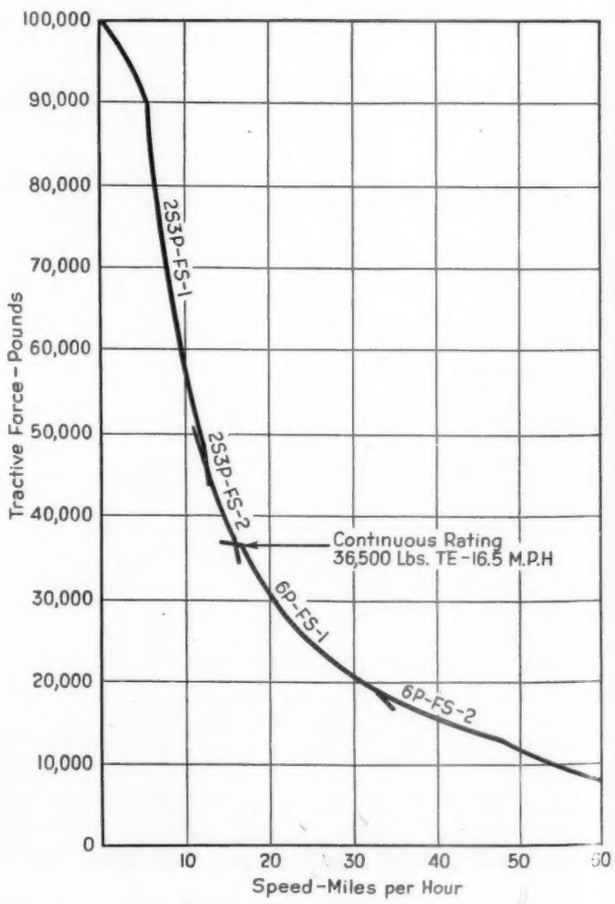
Mechanical and Electrical Features

The cab, running gear and electrical equipment of the Illinois Central Busch-Sulzer locomotive were designed and manufactured for Busch-Sulzer by the General Electric Company. Referring to one of the tables, overall dimensions and detailed weights are shown. The locomotive develops 36,500 lb. continuous tractive force at 16.5 m.p.h. and 86,500 lb. tractive force, assuming a maximum ratio of adhesion of 25 per cent.

By taking advantage of the maximum bridge loading permitted by the railroad, it was possible to limit the number of axles to six and thereby design a simple running gear consisting of two three-axle, non-articulated swivel trucks upon which the cab is mounted.

The problem of holding the total weight within limits, permitting the use of six axles, was a serious one, without resorting to extensive use of special material in the cab. However, by putting the draft gear on the trucks, no part of the platform carries more than one-half of the drawbar pull; and by using a heavy centerplate, a suitable design was obtained. The trucks, centerplate and cab underframe are designed to withstand a buffing load of 710,000 lb.

The frame of each truck is an integral casting, of substantial construction throughout. A bridge structure is used between the front end frame and the two middle



Tractive-Force-Speed Curve

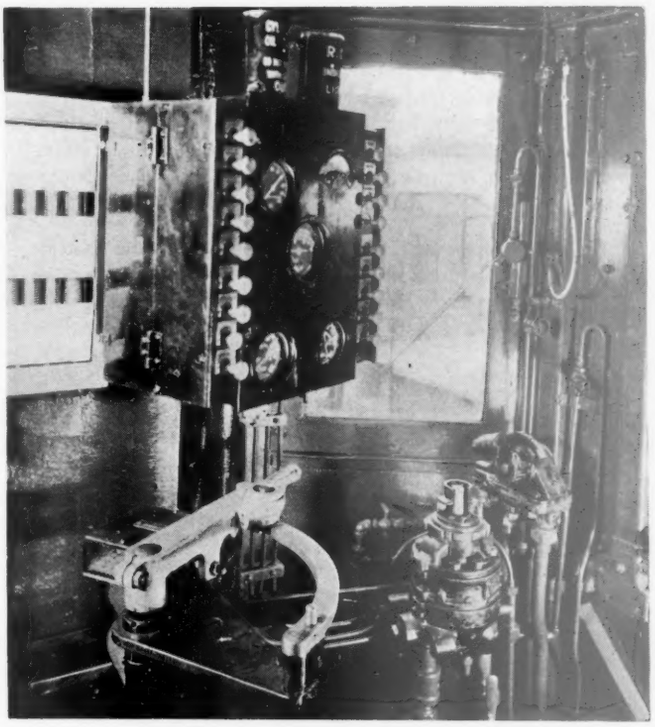
transoms for carrying buffing stresses directly to the center bearing. In the box sections of the side frames, the equalization and semi-elliptic spring systems are carried. Coil springs are interposed between the truck frame and the ends of the semi-elliptic springs to absorb high frequency vibrations. Standard boxes carry 7½-in. by 14-in. journals. Wheels are 39-in. rolled steel with floating babbitt-faced hub liners. The friction draft gear is carried in a pocket cast in the frame. Two 14-in. by 10-in. brake cylinders operate the extremely heavy brake work which is completely equalized. A single flanged shoe is used on each wheel, brake adjustment being made by a turnbuckle at the front end of the truck where it is accessible. Braced and illuminated end steps with splash guards are a feature. The truck design throughout is gaged to stand the punishment of heavy freight work and the riding qualities are exceptionally good.

The Electric Motors

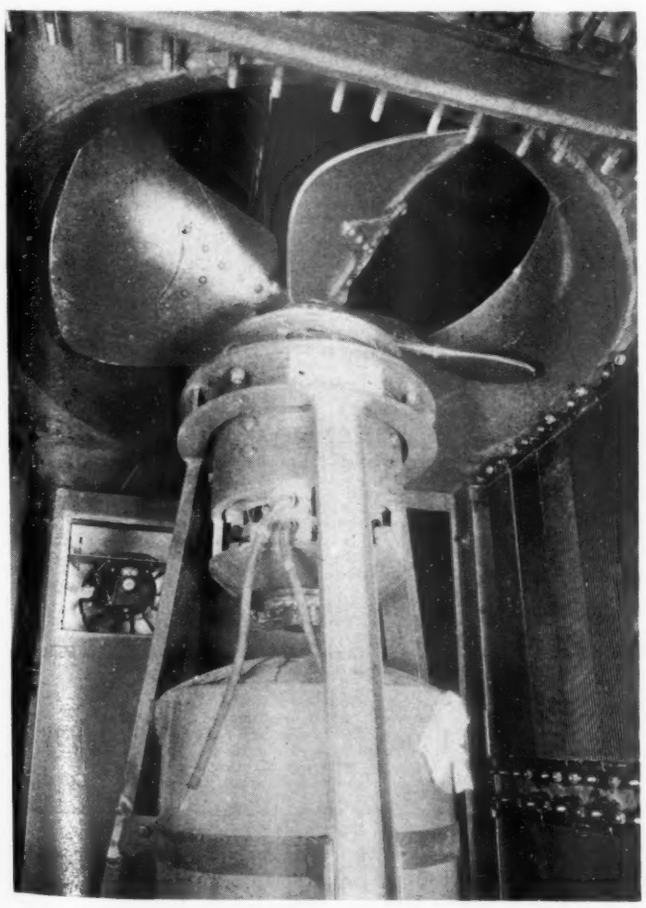
Each axle carries a General Electric 300-hp. single-geared motor, axle hung and spring-nose suspended on the truck transom. The truck pedestals carry removable shoes so that wheels and axles may be dropped without disturbing the traction motor.

Renewable spring-steel liners are provided on journal boxes, pedestal shoes, center plates and side bearings. Case-hardened pins and renewable bushings are used in all important points in the brake rigging as well as in all equalizer and spring-hanger bearings.

The problem of underframe design, with the deflection held to an acceptable value without getting into excessive weight, presented some difficulties, since the engine-generator set alone weighs over 50 tons and has to be supported on the underframe midway between center-plates 37 ft. 4 in. apart. Only by fabricating the structure was it possible to meet weight restrictions and still secure sufficient stiffness. The success of the design developed is shown by the fact that the total deflection was approximately ⅜ in. at the center, with a bending moment of 11,000,000 ft.-lb., and a maximum calculated stress of 10,600 lb. per sq. in.



The Operator's Control Station



The Radiator Compartment, Showing the Vertical Fan

The cab is a box type with radiator assemblies ahead of an operating compartment at each end, the engine room occupying the mid portion. The cab structure is built up directly on the main underframe just described. The side and roof sheets which are respectively 0.109 in. and 0.172 in. copper bearing steel, are electrically spot and line welded to stiffening members, giving a perfectly smooth exterior of pleasing appearance.

The sand boxes, one in each front corner post of the radiator compartments, are filled from the platform. The water and fuel-oil filling connections are reached from the ground. The main lubricating-oil system is filled from either end through connections on the corner of the roof and accessible from the steps on the side of each radiator compartment.

Equipment Accessibly Located

The equipment layout is characterized by accessibility and ease of maintenance. The engine-generator set occupies the greater portion of the central compartment, with control and air brake equipment, engine auxiliaries and traction-motor blower sets disposed at each end.

Three hatches are provided for taking out engine, generator or other heavy equipment. The top of the engine is made accessible for cylinder-head or piston removal by taking off the main hatch cover.

The battery, consisting of 56 cells of MVMHT-21 340-amp.-hr. capacity, is mounted in two compartments in the sides of the main girders of the underframe, and is serviced conveniently from the ground. The 1,200-gal. fuel tank is of welded construction and is suspended from the cab underframe.

With a view to minimizing maintenance costs, all apparatus is located not only for easy accessibility in place but also for easy installation or removal.

The Diesel engine is directly connected through a

flexible coupling to the generator, which is the largest traction-type unit yet built. This machine consists of a main and an auxiliary generator, the overhung auxiliary generator armature being mounted on an extension of the main generator shaft beyond the single anti-friction bearing. The engine end of the main generator armature is supported by the coupling. The entire set is longitudinally ventilated by a fan mounted on the coupling-end armature head.

Principal Dimensions of I. C. 2000-Hp. Diesel-Electric Switcher

Length over couplers	60 ft.
Total wheelbase	48 ft.
Rigid wheelbase	11 ft.
Wheel diameter	39 in.
Driving-motor gear ratio	62 to 15
Weights:	
Mechanical portion	144,800 lb.
Engine and accessories	84,300 lb.
Electric transmission and auxiliaries	99,600 lb.
Locomotive, light	328,700 lb.
Locomotive, ready to run	346,000 lb.
Total weight per axle (six)	57,700 lb.
Weight of bare engine	72,000 lb.
Engine weight per brake hp.	36 lb.
Locomotive ratings:	
Continuous tractive force	36,500 lb.
Speed at continuous rating	16.5 m.p.h.
Tractive force, 25 per cent coef. of adhesion	86,500 lb.
Maximum speed	60.0 m.p.h.
Diesel-engine rating and dimensions:	
Continuous rating Busch-Sulzer two-cycle, V-10 engine	2,000 brake hp.
Normal engine speed	550 r.p.m.
Idling speed	275 r.p.m.
Cylinder bore and stroke	14 in. by 16 in.
Crank-pin bearing diameter	14 in.
Brake M.E.P. at 2,000-hp. rating	58.46 lb. per sq. in.
Air compressor displacement (2 comp.)	200 cu. ft. per min.
Fuel tank capacity	1,200 gal.

The main generator is a 14-pole machine converting an average engine output of 1,930-hp. to traction-motor input at a maximum efficiency of 94.4 per cent. Over the entire load range, the efficiency is said to be never less than 93 per cent. The weight of the machine is 18,000 lb. or 9.3 lb. per input hp. at 550 r.p.m.

The traction motor equipment consists of six GE-716 single-geared motors, each forced ventilated with 1,500 cu. ft. of air per minute through ducts in the cab underframe and a sliding-plate connection. The maximum reduction gearing of 15 to 62 actually permits a maximum locomotive speed of 64 m.p.h. corresponding to 2,280 armature r.p.m., although the maximum permissible speed is nominally 60 m.p.h.

The speed-tractive-force characteristics of the locomotive are the following points:

1. The maximum tractive effort of 100,000 lb., assuring ability to start any train encountered in this service.
2. Continuous rating of 36,500 lb. tractive effort at 16.5 m.p.h., assuring ample electrical capacity.
3. Full Diesel-engine horsepower utilization up to 46 m.p.h., assuring maximum performance of the locomotive for transfer service over a wide range of speed.
4. Transmission efficiency of about 82 per cent to 86 per cent from 15 m.p.h. to 46 m.p.h.

Constant engine horsepower is maintained over a wide range of locomotive speed for transfer service (46 m.p.h. maximum) by a combined exciter and pilot generator belted to the shaft of the main unit and mounted above the auxiliary generator.

The traction-motor control is handled with standard electro-pneumatic contactors and reversers. The locomotive speed is controlled by a combination of Diesel-engine speed and traction-motor combinations.

Excellent visibility is obtained from the engineer's position. Duplate safety glass is used in all doors and windows. The interior of the cab is lined with Silento felt for both heat and sound insulation. The warm radiator compartment on one side, the large air-blast hot-water heater with re-circulating duct, and insulation assure a comfortable cab even in the severest winter weather in Chicago.

Auxiliaries—Cooling System

The entire auxiliary system is designed for continuous operation at full output regardless of Diesel-engine speed within its operating range. For reliable and satisfactory performance of water cooling equipment, motor ventilation system, battery and compressors, a locomotive designed for long transfer runs or road service needs this.

The auxiliary generator, which is part of the main generating set, as mentioned before, has its voltage held constant over the entire operating range of Diesel-engine speed. The auxiliaries, driven from this source of power, are as follows: Two 100-cu. ft. (each) displacement two-stage air compressors; two radiator blower sets; two traction-motor blower sets; one water-heater blower and ignition set; and two operating cab-heater blower sets. In addition to these, battery charge and power for control and lighting is taken from the constant-voltage source.

The engine cooling system was designed to insure sufficient capacity for continuous operation at full horsepower during the hottest weather encountered in Chicago. The Diesel engine has two water circulating pumps, one for each bank of cylinders, and two lubricating-oil pumps.

A feature of the radiator design is the three-sided construction providing a large surface exposed to outside air, with the ventilating fan so arranged that almost uniform velocity is maintained throughout the complete air path. This results in obtaining the required cooling with a relatively low fan horsepower. The aphonic type fan is of high efficiency and is surprisingly quiet. The latter feature is very important on an installation of this kind because of the tremendous amount of air handled. The two blowers deliver approximately four tons of air a minute (114,000 cu. ft.) through the radiators.

Partial List of Specialties on I. C. 2000-Hp. Switcher

Locomotive:	
Builder-complete locomotive	General Electric Co., Schenectady, N. Y.
Diesel engine	Busch-Sulzer Bros., St. Louis, Mo.
Electric transmission	General Electric Co., Schenectady, N. Y
Storage battery	Electric Storage Battery Co., Phila., Pa.
Traction-motor fans	American Blower Corp., Detroit, Mich.
Blower fans and aux. motors	General Electric Co., Schenectady, N. Y.
Radiators	Modine Mfg. Co., Racine, Wis.
Truck frames	Gen. Steel Castings Corp., Granite City, Ill.
Driving wheels	Edgewater Steel Co., Pittsburgh, Pa.
Foundation brakes	American Brake Co., St. Louis, Mo.
Air brakes	New York Air Brake Co., New York
Hand brake	National Brake Co., Buffalo, N. Y.
Coupler and coupler yoke	Nat. Malleable & Steel Castings Co., Cleveland, O.
Journal boxes	General Electric Co., Schenectady, N. Y.
Draft gear	W. H. Miner, Chicago
Air brake compressors	General Electric Co., Schenectady, N. Y.
Exhaust mufflers	Burgess Battery Co., Freeport, Ill.
Air-intake filter and muffler	Burgess Battery Co., Freeport, Ill.
Flexible exhaust connections	Eclipse Aviation Corp., East Orange, N. J.
Water heater	Vapor Car Heating Co., Chicago
Flexible metallic connections	Barco Mfg. Co., Chicago
Cab radiators	Rome-Turney Radiator Co., Rome, N. Y.
Steam pipe & cab insulation	Johns-Manville Corp., New York.
Steam end valves	Vapor Car Heating Co., Chicago
Sanders	Viloco Ry. Equipment Co., Chicago
Lubr. and fuel oil filters	Cuno Engineering Corp., Meriden, Conn.
Lubr. and fuel oil gages	Consolidated Ashcroft-Hancock Co., Bridgeport, Conn.
Bell ringer	Transportation Devices Co., Indianapolis, Ind.
Wind deflectors	Prime Mfg. Co., Sidney, Ohio
Horns	Leslie Co., Lyndhurst, N. J.
Headlights, marker lights, etc.	Pyle-National Co., Chicago
Lubr. and fuel-oil priming pumps	Northern Pump Co., Minneapolis, Minn.
Safety glass	Pittsburgh Plate Glass Co.
Diesel Engine:	
Flexible coupling	Thomas Flexible Coupling Co., Warren, Pa.
Lubr.-oil circulating pumps	Schutte-Koerting Co., Philadelphia, Pa.
Pyrometer	Illinois Testing Laboratories, Chicago
Cylinder lubricator	Madison-Kipp Corp., Madison, Wis.
Hot water heater	Vapor Car Heating Co., Chicago
Fuel oil booster pump	Brown & Sharp, Providence, R. I.

The radiator is composed of sections which are bolted to headers. This permits replacement of any one section by simply removing four nuts from the studs which also provide the liquid-tight connection. The intermediate and lower headers are of the floating type with the lower header resting on supporting springs, providing a flexible mounting to relieve the expansion strains due to temperature changes of the radiator.

Throughout the water, lubricating- and fuel-oil lines, copper tubing is used, saving weight and space, making a more accessible piping layout, and preventing pipe corrosion. Sweat fittings are employed except where unions are necessary to remove apparatus, resulting in an exceptionally tight piping installation. Flexible metallic joints are used for air and steam connections between cab and trucks, a steamline being installed for eventual use with heater trailers.

Freight Car Loading

WASHINGTON, D. C.

REVENUE freight car loading in the week ended August 15 totaled 736,497 cars, an increase of 8,204 cars as compared with the week before and an increase of 122,492 cars, or 19.9 per cent, as compared with the corresponding week of last year. All commodity classifications except grain and grain products showed increases as compared with last year, but merchandise, grain, and coke showed decreases as compared with the week before. The summary, as compiled by the Car Service Division of the Association of American Railroads, follows:

Revenue Freight Car Loading

For Week Ended Saturday, August 15

Districts	1936	1935	1934
Eastern	147,289	126,500	124,840
Allegheny	148,439	114,828	106,788
Pocahontas	51,865	41,358	38,750
Southern	98,250	81,804	80,910
Northwestern	124,432	102,521	98,192
Central Western	108,846	97,902	100,851
Southwestern	57,376	49,092	51,457
Total Western Districts	290,654	249,515	250,500
Total All Roads	736,497	614,005	601,788
Commodities			
Grain and Grain Products	42,771	42,921	39,607
Live Stock	15,248	14,278	31,485
Coal	117,033	89,894	92,974
Coke	8,365	4,781	3,734
Forest Products	36,547	30,543	22,584
Ore	56,132	34,971	28,668
Merchandise L.C.L.	165,337	157,878	159,894
Miscellaneous	295,064	238,739	222,842
August 15	736,497	614,005	601,788
August 8	728,293	582,077	603,968
August 1	747,551	595,297	612,660
July 25	731,062	595,572	610,042
July 18	720,402	592,672	616,040
Cumulative Total, 33 Weeks	21,628,758	19,176,980	19,606,054

Car Loading in Canada

Car loadings on Canadian railways for the week ended August 15 totaled 50,368, as compared with 46,036 for the previous week and 43,101 for the corresponding week last year, according to the compilation of the Dominion Bureau of Statistics.

	Total Cars Loaded	Total Cars Rec'd from Connections
Total for Canada:		
August 15, 1936	50,368	20,680
August 8, 1936	46,036	21,553
August 1, 1936	46,471	22,324
August 17, 1935	43,101	17,728
Cumulative Totals for Canada:		
August 15, 1936	1,449,987	763,023
August 17, 1935	1,414,664	708,524
August 18, 1934	1,394,702	735,236

A Survey of Sleeping Car Services, 1890-1935

WASHINGTON, D. C.

THE Bureau of Statistics of the Interstate Commerce Commission has issued a general review of the statistics relating to sleeping car finances and operations from 1890 to 1935, including data for many of the earlier years not covered by reports of the Pullman Company to the commission which began in 1910. At the end of 1935, the statement shows, the company had in service 8,007 cars, as compared with a maximum of 9,801 in 1930. Operations were conducted over 115,421 miles of railroad and the number of Pullman revenue passengers was 15,479,000, as compared with a maximum of 39,255,000 in 1920.

Pullmans Carry Half of All Traffic Except Commuters

In 1935 the Pullman passenger-miles amounted to 7,146,300,000, or 38.6 per cent of the railroad passenger-miles and 49.7 per cent of the railroad passenger-miles, excluding commutation. The rate of return on the investment in Pullman sleeping car property is given for the various years on two bases, the total investment and the total investment less accrued depreciation. On both bases the peak figures are shown for the year 1910, 14.1 per cent and 15.9 per cent, respectively. In 1932, 1933, and 1935 there were deficits. The statement includes the following:

The maximum amount of railway mileage operated was reached in 1928, the reduction to 1935 being 20,048 miles or 14.8 percent. The passenger peak occurred in 1920 at the time of the post-war revival, the decline down to 1935 amounting to 23,776,000 passengers or 60.6 percent. The car-miles run attained the maximum in 1929 and declined 37.1 percent to the level of 1935.

It is evident from the constantly increasing average journey of Pullman passengers, reaching the maximum of 462 miles in 1935, and from the high ratio of Pullman passenger-mileage to railway passenger mileage exclusive of commutation travel amounting to about one-half, that Pullman service has also suffered a loss of short haul traffic. The decline in passenger travel by rail since 1930, at the end of which depressed conditions set in, adversely affected Pullman travel to a greater degree than railway travel in general as indicated in the decrease in Pullman passenger-miles, 1935 under 1930, of 42.9 percent, and in railway passenger-miles, exclusive of commutation travel, of 28.8 percent.

Slump in Parlor Cars

The greatest stride in the installation of Pullman operated sleeping cars was made in the first decade of the century when the number was approximately doubled. The number of railway operated sleeping cars reached the maximum of 764 in 1916 amounting to 11.1 percent of the total number of sleeping cars operated. From 1916 to 1935 the number of Pullman sleeping cars increased 11.7 percent while the number of railway operated sleeping cars decreased 81.8 percent from 1916 to 1934. The maximum number of Pullman cars, both sleeping and parlor cars, was reached in 1930, since which there has been a reduction of 1437 sleeping cars or 17.4 percent, and a reduction of 269 parlor cars or 22.7 percent. While the Pullman Company in 1935 operated over fifty times as many sleeping cars as the railways, it operated but a little more than twice as many parlor cars.

The Pullman Company's operations extend into Can-

ada and Mexico as well as in the United States. The contract with the National Railways of Mexico in 1935 covered 2,564 miles of railway, while that with the Southern Pacific of Mexico covered over 1,000 miles. The operations in Canada include principally the New York Central Lines, Canadian National System and joint line operation over the Canadian Pacific in connection with through movements between the United States and Canada. From 1890 to 1935, Pullman car-miles increased 581,521,000 or 328.4 percent, and the number of passengers, 10,456,000 or 208.2 percent. In 1890, 35 car-miles were run for each passenger and in 1935, 49, an increase of 40 percent.

Peak Year Was 1919

The maximum operating income attained under company operation occurred in 1916, but the all-time maximum of $19,193,813 was reached in 1919 under operation by the United States Railroad Administration. The operating income in 1918 during federal control was $7,762,856 and for the entire year, 1920, including federal operations in January and February, amounted to $9,304,012.

The investment in cars in 1935 was 94.54 percent of the total investment in sleeping car property, including plant.

The demand for club and lounge cars in modern passenger trains is reflected in the increase of 189 percent in the investment in composite cars during the period, 1923-1935. The number of this class increased 77.6 percent during the same period. During the year 1935 standard sleeping cars to the number of 277, with a book investment of $5,950,266 or an average of $21,481 each, were transferred to the tourist sleeping car service.

The number of cars owned by the Pullman Company increased but 6 percent from 1923 to 1935 as compared with a 51 percent increase in the investment in such cars.

During the period, 1910 to 1935, approximately 11,200 cars were installed and 8,000 retired. If the cars had been retired in the order of their installation, all cars installed prior to 1910 would have been retired by the end of 1924 and no car would have been over 25 years old as of 1935, but, considering premature retirements, it is apparent that there remain some cars in excess of 25 years of age. The number of cars owned in 1935 was a decrease of 1,833 under the maximum of 1930 or 18.6 percent. The proportion of the total cars owned that were constructed of steel rose from 3.1 percent in 1910 to 97.9 percent in 1935. The steel passenger-train cars of Class I steam railways in 1935 amounted to 69.6 percent of the total owned.

80 Per Cent of Travel in Lowers

The increase in the average berth revenue in standard sleeping cars from 1911 to 1935 amounted to 53 percent, explainable in part by a 20 percent increase in rates in 1920 and in part by an increase of 34 percent in the average journey of a Pullman passenger. During the same period, the revenue per passenger-mile increased 28 percent. Upper and lower berth passengers are not segregated in the reports of The Pullman Company, but from a special analysis made by the company of all berth accommodations furnished for a period of seven years, it was found that 80 percent were for lower berths and 20 percent for upper, notwithstanding that the charge for an upper berth is 80 percent of that for the lower berth. It was also found that the actual number of berth passengers carried exceeded the berth accommodations furnished, counting one passenger to a berth, to the extent of from 8 to 10 percent.

The total miles of railway of approximately 110,000 (excluding mileage over the National Railways of Mexico and joint line operation) over which The Pullman Company operated in 1935, represented 53 percent of the total miles of Class I steam railways operated in passenger service.

What Contracts With Railroads Provide

Contracts with the railway companies vary as to certain details but the principles covering the responsibility and obligations of the Pullman Company and the railway companies are, generally speaking, uniform in character. A typical contract provides that the Pullman Company will furnish sleeping cars and parlor cars for operation on lines of the railway company, the railway company receiving all of the revenues from passenger fares and the Pullman Company receiving the revenue from the sale of seats, berths and other accommodations to passengers.

The Pullman Company assumes shop expenses and running repairs to the cars, except as above noted and the cost of supplies, and furnishes attendants to wait on the passengers, the railway company furnishing the same facilities it would for its own first class coaches for which Pullman cars are substituted, such as water and ice, heating and lighting the cars and cleaning the outside of the cars. The Pullman Company agrees to pay the railway company a share of the Pullman Company's revenue from the sale of accommodations in excess of a stated amount. Contracts made with railway companies where there is reason to believe the volume of business furnished by the railway companies will not produce revenue sufficient to cover the Pullman Company's expenses of operation generally require the railways either to pay the Pullman Company the deficiency in revenue or a rate of mileage which is intended to cover such deficiency.

Of 65 contract rail lines in 1935, exclusive of 5 temporary and joint line arrangements, 26 were creditors of the Pullman Company under the Contract revenue-Dr. settlements. Returns for the car mileage payments to the Pullman Company by individual railways are not required by the Commission in the annual report of the Pullman Company.

* * *

On the Chicago & Eastern Illinois

Eastern Time for Chicago Denied

I.C.C. approves including lower peninsula of Michigan in Eastern zone, but sees danger in admitting Chicago

WASHINGTON, D. C.

CONCLUDING that a westward relocation of the boundary of the Eastern standard time zone to embrace the city of Chicago "cannot be made within the Congressional standards and consistently with the principles uniformly applied hitherto," Division 2 of the Interstate Commerce Commission has denied a petition of the city of Chicago asking it to modify its orders defining the limits of the standard time zones so as to give that city the same time as New York. As the same time the commissioners found that the convenience of commerce would be served by a modification of the boundary line of the Eastern zone to include the Lower Peninsula of Michigan within that zone and granted in part a petition of the state to that end. In 1932 it had denied a petition to include the entire state in the Eastern zone.

Disregard of Effect on Neighboring Communities

Chicago, by city ordinance, had adopted Eastern time for the transaction of city business on March 1 but, as the commissioners pointed out, the modification of the federal zones asked would have dragged in a large area of surrounding territory against the wishes of people outside of Chicago, and from a railroad standpoint, they said, the placing of the zone boundary at or near the immense Chicago terminal would be fraught with incalculable and unavoidable difficulty and danger. They also took occasion to emphasize the confusion which results from "the shifting about of time standards to suit the supposed needs of individual states or communities regardless of the effect upon neighboring communities or states."

Since the repeal of the daylight saving section of the standard time act in 1919, the report pointed out, "there has been no warrant under federal law for the use of any time except that based upon the mean astronomical time of the governing time meridians. The use of local or state daylight saving time has been entirely a local or state matter without the sanction of the federal government, although a daylight saving law operating for limited purposes other than those named in the standard time act was held by the Supreme Court not to conflict with the federal act."

So much of the description of the present boundary line between the Eastern and Central time zones prescribed in the commission's previous reports as defines the line in Michigan, Indiana, and Ohio was amended in a detailed order accompanying the report. The report includes the following:

Extracts From Report

As has been repeatedly pointed out in our reports in this proceeding, the fixation of standards of time can not be left to the individual states or to their subordinate municipal agencies, except at the cost of complete lack of uniformity, and the shifting about of time standards to suit the supposed needs of individual states or communities, either the year round or for the summer months, compels neighboring, less powerful states, to yield their equal rights of sovereignty and to concede to the powerful community the domination over time standards regardless of the effect upon neighboring communities or states, with no respect for their desires, and heedless of the effect upon operations in interstate commerce or the laws of the United States governing interstate carriers and government officers. The present record makes it clear that the enormous population of Chicago—the second city in size in the nation—and the importance of its commerce have extended the effect of its municipal ordinances into many other communities in the state of Illinois, and in the neighboring states of Indiana and Wisconsin, against the statutes and counter to the expressed desires of the peoples of those states. We are now asked to bring about uniformity by the prescription of a single standard, and that the Eastern zone time.

At the outset we have to consider an objection that the commission can not grant the prayer of the city without doing violence to the standards laid down by Congress in the standard time act. It is pointed out that the Congress has related the zones it created to definite time meridians, and the close location of Chicago with relation to the governing meridian for the Central zone, previously set out, is such that to take it out of that zone and assign it to another zone, governed by a remote meridian, is to run counter to the standards laid down for us by Congress, and hence beyond our power.

The standards laid down by the act are (1) the location of the meridians themselves, and the provision for zones which match them; and the intent to establish the standard time of the United States; and (2) the requirement that the limits of the zones shall be defined by us, having regard for the convenience of commerce and the existing junction points and division points of common carriers engaged in interstate or foreign commerce. While these legislative standards for our guidance in the administrative task of defining the limits of the several zones are general in language, from our original report shortly after the enactment of the law until the present time we have given them a continuous and consistent interpretation, which we have made clear in our reports in this proceeding and to the Congress, which have never been challenged and are not challenged upon this reopened proceeding, and which have twice been recognized by Congress in cases where a radical deviation from what was possible under our construction of the act was deemed advisable, and Congress therefore legislated directly to make exceptions which the commission had not been able to see its way clear to make. In each instance the declination of the commission to do that which was afterwards done directly by Congress was because of the inconsistency of what was proposed with the construction placed by the commission on the legislative standards given by Congress for its guidance.

"Vital National Interests"

The general principles thus established and followed should properly be applied here. The direction in the statute to have regard for the convenience of commerce is to be taken in its broadest sense, requiring such an adjustment as will most greatly facilitate vital national interests; state statutes and municipal ordinances for the maintenance of a given standard of time are to be observed, where possible; and to the extent possible, states should be left intact within a single zone. Commercial considerations which link one section or state with another are to be respected as far as possible, without special consideration of any particular occupations or trades. Convenience of commerce and the existing junction points and division points of common carriers are made of controlling importance as far as the federal statute is concerned. The zone boundaries should be fixed as close to the median meridian, half way between the respective time meridians, as permissible, with time-breaking points somewhat west of the median meridian. To the extent possible, the zones are to be made compact and symmetrical, and time-breaking points are to be located in small rather than in large centers, or else in the more sparsely settled territory. Congress has repealed the daylight saving feature of the act, and the commission lacks discretion to adjust the zone boundaries for the

avowed purpose of providing fast or slow time for a particular community, either the year around or during particular months of the year. And since the Supreme Court has held in *Massachusetts State Grange* v. *Benton, supra,* that regulations of time standards by authority of the states for local purposes may be met by the prescription of standards under local authority, with no necessary inconsistency between such acts and that under which we are proceeding, consideration of local convenience and needs may be left by us to the states, which are competent and able to act thereon. With these established principles recapitulated for convenience, we pass to the particular matters herein developed of record.

Much of the voluminous record, for and against the change suggested by the City of Chicago, relates to purely domestic matters, wholly disassociated from the convenience of commerce, or the junction and division points of common carriers, and not related to any of the tests previously outlined as proper for consideration in applying the Congressional standards. Such testimony we regard as of local concern under the existing state of the law.

Convenience of Commerce

The proponents of the time change stress the importance of the industrial, financial, and commercial connection between Chicago and the East, and the benefits which would result to Chicago interests from the inclusion of Chicago within the Eastern time zone. Our policy, "having regard for the convenience of commerce" has been to respect, whenever possible, the commercial considerations which link one section with another so that the customary hours of business in closely allied sections may coincide. However, it is not here apparent that a parity of time with financial and industrial connections to the East of Chicago would be of any greater importance to the convenience of commerce, taken as a whole, than is the existing uniformity of time between Chicago and the agricultural and commercial sections in the Middle West.

It is the "convenience of commerce" in a broad sense for which we must have regard, since we are proceeding under an Act "to provide standard time for the United States." Confusion would result from the operation of the railroads into and out of Chicago on Central time, while Eastern time is observed locally in the city. Confusion does result every year when that city goes on a standard of time for several summer months which differs from the time observed in surrounding areas. The difficulties and inconveniences which are caused by the observance of two standards of time within the same community have been pointed out in prior reports herein. A conflicting local standard of time is the cause of much irritation and inconvenience, but that can not be avoided in the present state of the law. Under the arrangement in effect in Chicago prior to March, 1936, under which local daylight saving time was observed during a portion of the year, two periods of serious confusion were experienced, the one at the beginning and the other immediately following the close of the daylight saving period. The elimination of this source of confusion is urged by the proponents of Eastern time as one of the benefits of the proposed change, providing a uniform standard of time throughout the year.

Chicago Interests Not In Agreement

Despite the decisive vote (44 to 3) of the city council adopting Eastern time for Chicago, there is considerable opposition by Chicago interests. Indeed, the city has requested us to defer action on its petition until its own ordinance can be tested on a referendum at the coming general election, if sufficient signatures can be obtained upon a referendum petition therefore. But as the action of the city can legally control only for a limited number of domestic purposes, while the standard time act operates upon other purposes, and the city ordinance and federal statute are to be kept out of opposition, whether the voters of Chicago approve or disapprove the action of the council of that city as to matters of exclusively local concern can not in any wise control the determination of what rule is to govern under the federal statute. The request of the city for us to defer decision would necessarily compel us to defer proper attention to the reopened Michigan petition. We therefore proceed to a determination of the matters presented under the submission.

The Chicago livestock and grain exchanges opposed the time change because of its adverse effect upon Chicago as a market for these commodities. The bulk of the livestock and grain shipments to Chicago originate in the Central zone. A difference of time between Chicago and the shippers of these agricultural products tends to make more difficult the satisfactory contact which leads the producer to ship to the Chicago market instead of its numerous western competitors.

Many of the separate Illinois municipalities within the Chicago metropolitan area have adopted Eastern standard time, following the action of the city council of Chicago. Throughout Illinois outside the Chicago area there is no showing of public sentiment favorable to the change; in fact, opposition was quite general. The state of Illinois extends from 2° 30′ east of the ninetieth (Central) meridian to 1° 30′ west of that line. It is approximately bisected by the meridian which governs the Central time zone, and no part of the state is more than ten minutes of time away from the astronomical mean time prescribed for the whole Central zone.

The state of Wisconsin is quite similarly located. Its interests are predominantly agricultural, and it has had no difficulty with the use of the normal, or Central standard of time. Wisconsin by law has adopted Central time as the state standard, and forbids the use or display of any other time. In this proceeding it opposes any change in the zone boundary which will disturb its continued use of Central time.

Representatives of local labor unions in Chicago and of the state federations of labor in Illinois and Wisconsin objected to the hardships, inconveniences, and dangers which would be imposed upon the workingmen and their families by an advance in time. The railroad labor unions stressed the danger to railroad employees which would be brought about by requiring a change of time to be made except at division points. Farmers and farm associations of Illinois, Wisconsin, and Indiana opposed an advance of time, as necessitating the performance of an increased proportion of farm work in the dark hours of the early morning.

The proposed westward movement of the time zone boundary to a point beyond Chicago is objected to as being too radical a departure from solar time and too remote from the governing time meridian to come within the reasonable intendment of the standard time act.

Dangerous From Railroad Standpoint

From a railroad operating standpoint the placing of the zone boundary through or near this immense terminal would be fraught with incalculable and unavoidable difficulty and danger.

Any attempt to draw a line through Chicago so as to require the eastern roads to operate on Eastern time and the western roads on Central time would be futile. In may cases the eastern lines operate on tracks of the western lines, or western lines on eastern tracks. In some instances the same belt railway line operates on the tracks of both eastern and western roads, or eastern and western lines both use the same tracks of the belt road. The injection of two standards of time into such a complex situation must necessarily result in confusion and danger. The railroad representatives could offer no practicable solution of the operating difficulties which would be brought about by a time change at Chicago, and that offered by the technical experts of the city at the hearing is not regarded as economically feasible or as practical from the standpoint of operation. If Chicago is to be included in the Eastern zone, then the Mississippi river presents the only logical boundary line. Such a change would transfer Wisconsin to the Eastern zone over its vigorous protest, and would also involve serious operating difficulties in the terminals at Duluth and St. Paul, Minn., St. Louis, Mo., and other crossings. It would extend the Eastern time zone more than an hour and 10 minutes west of the Eastern time meridian. Such a definition of the zone would do violence to the standards set by Congress when it prescribed the use of the ninetieth meridian to govern the Central zone. The repercussions on the commerce of the territory west of the Mississippi river would be serious.

The state of Michigan supports the petition of the city of Chicago so far as it may be considered as seeking the extension of the Eastern zone boundary to include the Lower Peninsula of Michigan. The record discloses no opposition within the Lower Peninsula to the observance of Eastern standard time. With respect to the Upper Peninsula, the controlling commercial connections are with Wisconsin rather than with the East, and the state has modified its original petition in this proceeding by eliminating the request for the inclusion of any portion of the Upper Peninsula in the Eastern zone, unless Wisconsin is also included.

Table Tells Story of Tie Renewals During the Depression

Data compiled from annual reports of the railroads show sharp variations in individual records

SEVENTY-TWO railways in the United States inserted more ties per mile of maintained track in 1935 than in 1934, 3 roads applied the same number, and 69 roads used less ties in 1935 than in 1934. These are among the comparisons that can be drawn from the tabulation of crosstie renewals prepared by the Committee on Ties of the American Railway Engineering Association from statistics compiled by the Interstate Commerce Commission, and reproduced here in condensed form. The statistics cover the renewals of 144 Class I roads of the United States as well as the Canadian National, the Canadian Pacific and the Temiskaming & Northern Ontario. The table does not show totals or weighted averages for the railways as a group.

The present tabulation is of particular interest because it includes the five-year averages for 1931-1935, inclusive, and is, therefore, not influenced by pre-depression operations. Thus, the railroads of the United States having the lowest five-year renewal averages per mile of track (excluding roads maintaining less than 500 miles of track) are as follows: The Pittsburgh & Lake Erie, 23; the St. Louis, Brownsville & Mexico, 46; the Reading, 47; the Fort Worth & Denver City, 54; the Central of New Jersey, 56; the Lehigh Valley, 60; and the Pennsylvania, 60. The roads with the highest average rate of renewal for the five years (also excluding several smaller roads) are: The Southern, 290; the Norfolk Southern, 285; the Mobile & Ohio, 284; the St. Louis, San Francisco & Texas, 276; the Alabama Great Southern, 264; and the Western Pacific, 261.

Changes in the rate of renewals between 1935 and 1934 were less pronounced than in the years immediately preceding, but a few noteworthy changes on the more important railways may be noted as follows, the figures being those for 1934 and 1935 in the order given: The Boston & Maine, 118-64; the Wheeling & Lake Erie, 63-221; the Gulf, Mobile & Northern, 157-207; the Chicago, Milwaukee, St. Paul & Pacific, 184-241; the Denver & Salt Lake, 191-315; the Northwestern Pacific, 136-73; and the Texas & New Orleans, 121-66.

With few exceptions, little change occurred in 1935 with respect to the percentage of treated ties inserted on the various railways. Appreciable decreases, compared with the percentage of ties treated in 1934, occurred on four railways as follows: The Virginian—from 69.7 to 33.2 per cent; the Mississippi Central—from 90.2 to 45.8 per cent; the Chicago Great Western—from 73.9 to 27.0 per cent; and the St. Louis Southwestern—from 99.4 per cent to 69.3 per cent.

Among the railroads that used an appreciably larger proportion of treated ties in 1935 than in 1934 are the Grand Trunk Western which increased its use of treated ties from 57.4 to 90.4 per cent; the Atlantic Coast Line—from 4 to 28.3 per cent; the Gulf & Ship Island—from 4.3 to 42.6 per cent; the Tennessee Central—from 7.4 to 34.5 per cent; the Denver & Salt Lake—from 26.1 to 43.5 per cent; and the St. Louis, San Francisco & Texas—from 26.7 to 61.8 per cent.

The tabulation also affords an opportunity for a study of the extent to which the various railroads use treated ties. Thus, according to the figures for 1935, 30 railways applied treated ties exclusively, on 52 railways treated ties represented from 80 to nearly 100 per cent of the renewals; on 11 railways they represented from 60 to less than 80 per cent; on 10 railways from 40 to 60 per cent; on 8 railways from 20 to 40 per cent; on 14 railways from a negligible number up to 20 per cent; while on 19 railways no treated ties were used.

Three measures of the tie renewal policies of the various railways are presented in the three columns at the right side of the table. One of these gives the weighted average cost for wooden crossties, another gives the cost of wooden crosstie renewals per mile of maintained track and the last one tabulates the cost of wooden crosstie renewals per thousand equated gross ton miles.

Statistics on Crosstie Renewals on Leading Railroads in the United States and Canada for the Calendar Year Ending December 31, 1935

ALL FIGURES ARE EXCLUSIVE OF BRIDGE AND SWITCH TIES

Road	Number of wooden cross tie renewals per mile of maintained track						Per cent wooden cross tie renewals to all ties in tracks		Wooden ties untreated (U)		Wooden ties treated (T)		Weighted average cost per wooden cross tie	Cost of wooden cross tie renewals per mile of maintained track	Cost of wooden cross tie renewals per thousand equated gross ton-miles
	1931	1932	1933	1934	1935	5 year average	1935	5 year average	Per cent applied	Average cost	Per cent applied	Average cost			
New England Region:															
Ban. & Aroos.	236	203	189	204	190	204	6.7	7.1	100	$0.56	..	..	$0.56	$106	$0.062
B. & M.	164	64	75	118	64	97	2.2	3.3	13.0	.67	87.0	$1.58	1.47	94	.025
C. N. R. in New Eng.	87	57	87	85	92	82	3.0	2.7	33.7	.83	66.3	1.83	1.49	137	.083
C. P. R. (lines in Me.)	262	181	170	182	153	190	5.3	6.6	7.3	.54	92.7	1.26	1.21	186	.040
C. P. R. (lines in Vt.)	254	200	134	68	53	142	1.5	4.1	1.1	.55	98.9	1.25	1.24	66	.017
Cent. Vt.	237	174	184	193	153	188	5.0	6.1	8.0	.61	92.0	1.46	1.40	213	.054
Me. Cent.	222	184	167	192	187	190	6.2	6.3	57.4	.73	42.6	1.58	1.09	204	.083
N. Y. Conn.	293	229	131	257	213	225	6.7	7.1	..	..	100	1.55	1.55	330	.029
N. Y., N. H. & H.	165	121	73	62	71	98	2.3	3.4	..	..	100	1.31	1.31	93	.023
Rutland	210	189	147	129	109	157	3.5	5.2	..	..	100	1.19	1.19	129	.044

See footnotes, page 315.

Crosstie Renewals, 1935 (continued)

Road	Number of wooden cross tie renewals per mile of maintained track						Per cent wooden cross tie renewals to all ties in tracks		Wooden ties untreated (U)		Wooden ties treated (T)		Weighted average cost per wooden cross tie	Cost of wooden cross tie renewals per mile of maintained track	Cost of wooden cross tie renewals per thousand equated gross ton miles
	1931	1932	1933	1934	1935	5 year average	1935	5 year average	Per cent applied	Average cost	Per cent applied	Average cost			
Great Lakes Region:															
A. A.	114	179	130	106	106	127	3.6	4.3	..	..	100	$1.34	$1.34	$142	$0.642
Cam. & Ind.	a	235	348	341	237	290	8.8	10.6	100	$0.89	..	..	.89	211	.105
D. & H.	111	125	139	103	106	117	3.5	3.8	.07*	1.18	90.8*	2.10	2.10	223	.043
D., L. & W.	76	64	53	108	92	79	3.2	2.7	4.3	.31	95.7	1.45	1.40	128	.020
Det. & Mac.	97	126	114	101	132	114	4.4	3.8	73.8*	.46	25.8*	.73	.53	70	.092
Det. & Tol. Shore Line	84	88	100	83	134	98	4.4	3.2	..	..	99.4*	1.75	1.75	235	.051
Erie	173	135	106	104	90	122	3.1	4.2	0.4	.31	99.6	1.45	1.45	131	.021
G. T. W.	156	115	141	152	153	143	4.8	4.5	9.6	.98	90.4	1.38	1.34	206	.058
L. & H. R.	54	55	22	23	46	40	1.8	1.6	..	..	78.6*	1.67	1.67	77	.017
L. & N. E.	107	72	72	75	69	79	2.3	2.6	2.2	.46	97.8	1.36	1.34	93	.035
L. V.	53	45	63	66	74	60	2.5	2.1	..	..	100	1.35	1.35	100	.020
Monongahela	145	81	131	155	157	134	5.4	4.6	†	1.44	100	1.65	1.65	260	.083
Montour	163	95	102	115	103	116	3.7	4.1	22.7	1.17	77.3	2.10	1.89	194	.057
N. J. & N. Y.	145	172	111	82	70	116	2.4	4.0	..	..	100	1.42	1.42	99	.024
N. Y. C.	91	52	52	70	71	67	2.3	2.3	.2*	1.75	98.6*	1.35	1.35	96	.017
N. Y., C. & St. L.	70	73	61	84	88	75	2.8	2.4	..	..	100	1.61	1.61	141	.026
N. Y., O. & W.	116	105	90	69	83	93	2.9	3.3	1.3	.59	98.7	1.48	1.47	122	.037
N. Y., Sus. & West.	125	112	113	130	99	116	3.4	4.0	..	..	98.8*	1.31	1.31	129	.082
P. M.	191	140	118	123	127	140	4.2	4.6	1.2	.13	98.8	1.45	1.43	182	.052
P. & L. E.	4	5	35	41	29	23	1.0	0.8	..	..	100	2.05	2.05	59	.015
Pitt. & Sha.	159	182	218	260	261	216	10.3	7.9	64.7	.83	35.3	1.84	1.19	309	.297
P. & W. V.	117	88	114	187	170	135	5.9	4.7	100	1.03	†	.83	1.03	175	.054
P., S. & N.	165	140	154	183	174	163	5.9	5.6	99.7	.90	0.3	1.87	.90	157	.137
Wabash	119	134	129	130	139	130	4.5	4.2	0.3	1.10	99.7	1.47	1.47	205	.038
Central Eastern Region:															
A., C. & Y.	115	155	171	264	339	209	11.8	7.3	100	1.08	..	..	1.08	366	.194
B. & O.	51	47	73	81	91	69	3.2	2.4	1.5	1.03	98.5	1.42	1.41	128	.026
B. & L. E.	238	171	151	241	239	208	7.7	6.7	0.5*	.79	99.0*	2.13	2.12	507	.107
C. of N. J.	82	72	45	33	49	56	1.8	2.0	..	..	100	1.62	1.62	80	.017
C. & E. I.	98	100	92	98	100	98	3.2	3.2	..	..	100	1.07	1.07	107	.030
C. & I. M.	105	112	107	64	147	107	4.8	3.5	..	..	100	1.31	1.31	193	.040
C., I. & L.	99	66	65	82	97	82	3.2	2.7	†	.69	98.0*	1.04	1.04	101	.027
D., T. & I.	71	90	92	142	155	110	5.4	3.8	0.4	.53	99.6	1.25	1.24	193	.068
E., J. & E.	165	96	124	165	176	145	5.7	4.7	0.2*	.85	96.7*	1.37	1.37	242	.089
Ill. Term.	84	83	90	73	85	83	2.8	3.0	22.7*	.76	66.2*	1.13	1.03	88	.047
Long Island	91	69	42	64	58	65	2.0	2.3	..	..	100	1.24	1.24	73	.010
Mo.-Ill.	221	138	183	296	421	252	13.4	8.1	82.3	.84	17.7	1.19	.91	381	.413
Penna.	75	48	58	64	57	60	2.0	2.2	0.2	.42	98.8	1.56	1.56	89	.014
Penna.-Read. Seashore	114	23	4	56	49	49	1.8	1.8	..	..	100	1.18	1.18	58	.024
Reading	105	28	29	35	36	47	1.3	1.7	..	..	100	1.75	1.75	63	.014
Staten Is. Rapid Tran.	62	54	64	69	48	59	1.8	2.2	..	..	100	2.28	2.28	110	.031
West. Md.	187	116	180	219	202	181	7.0	6.3	19.8	.70	80.2	1.39	1.25	253	.061
W. & L. E.	133	46	78	63	221	108	7.3	3.6	15.2*	.90	83.9*	1.32	1.25	277	.075
Pocahontas Region:															
C. & O.	127	84	92	94	73	94	2.4	3.1	0.2*	.69	99.7*	1.18	1.18	86	.010
N. & W.	164	114	106	90	75	110	2.4	3.5	..	..	95.2*	1.10	1.10	82	.011
R., F. & P.	295	298	298	344	314	310	11.0	10.8	99.1*	.73	0.3*	1.82	.74	231	.029
Virginian	234	169	205	208	215	206	6.9	6.6	66.5*	.64	33.2*	1.24	.84	181	.029
Southern Region:															
A. G. S.	343	235	213	275	253	264	8.2	8.5	6.8	.76	93.2	1.37	1.32	335	.080
A. & W. P.	160	108	176	151	151	149	4.9	5.1	..	..	100	1.53	1.53	231	.059
West. Ry. of Ala.	171	67	168	120	138	133	4.5	4.6	..	..	100	1.41	1.41	194	
A., B. & C.	222	179	126	151	156	167	5.6	5.8	100	.68	..	..	.68	106	.063
A. C. L.	210	186	152	145	154	169	5.3	5.8	71.7	.67	28.3	.97	.76	116	.044
Cent. of Ga.	143	109	116	121	121	122	4.3	4.4	3.7	.65	96.3	.79	.79	96	.036
Charleston & West. Car.	237	205	197	163	177	196	6.1	6.8	100	.93	..	..	.93	166	.105
C., N. O. & T. P.	281	185	157	163	145	186	4.7	6.0	..	..	100	1.53	1.53	222	.031
Clinchfield	399	376	372	314	304	353	10.0	11.6	75.4	.74	24.6	1.41	.90	274	.055
Columbus & Greenville	152	229	219	220	271	218	8.6	6.9	41.5	.37	58.5	.97	.72	196	.128
F. E. C.	34	93	172	135	141	115	4.9	4.0	100	.73	..	..	.73	102	.039
Georgia	240	178	194	133	110	171	3.6	5.6	85.0	1.33	15.0	1.45	1.35	148	.051
Ga. & Fla.	256	155	201	266	278	231	10.3	8.6	100	.53	..	..	.53	148	.191
Ga., Sou. & Fla.	256	153	83	99	79	134	2.5	4.3	100	.76	..	..	.76	60	.027
Gulf & Ship Is.	288	30	135	171	152	155	5.0	5.1	57.4	.46	42.6	.92	.66	100	.071
G., M. & N.	142	136	119	157	207	152	6.5	4.9	8.8*	.47	84.3*	.90	.86	177	.079
I. C.	166	79	95	135	133	122	4.4	4.0	17.9	.55	82.1	.97	.90	120	.026
Y. & M. V.	236	70	93	123	149	134	4.9	4.4	52.5*	.56	47.4*	.92	.73	109	
L. & N.	168	103	109	110	107	119	3.8	4.2	10.5	1.01	89.5	1.25	1.22	131	.029
Miss. Cent.	167	96	106	155	218	148	6.9	4.7	54.2	.48	45.8	.89	.67	145	.126
M. & O.	287	272	230	317	314	284	10.0	9.0	100	.65	..	..	.65	205	.066
N., C. & St. L.	319	243	229	173	140	221	4.7	7.5	4.1	.37	95.9	1.06	1.03	144	.045
N. O. & N. E.	248	222	185	196	159	202	5.1	6.5	8.8	.73	91.2	1.36	1.30	207	.056
Nor. Sou.	228	163	284	386	362	285	12.7	10.0	100	.57	..	..	.57	206	.159
No. Ala.	351	325	375	364	377	358	12.1	11.4	100	.71	..	..	.71	267	.177
S. A. L.	258	215	204	215	237	226	8.2	7.5	54.3	.67	45.7	.88	.77	182	.066
Southern	336	298	260	282	273	290	8.7	9.2	80.2	.85	19.8	1.09	.89	244	.064
Tenn. Cent.	258	246	415	325	288	306	9.2	9.8	65.5	.68	34.5	1.67	1.02	295	.142
Northwestern Region:															
C. & N. W.	136	108	100	116	120	116	4.1	4.0	11.4	.51	88.6	.96	.91	110	.040
C. G. W.	243	247	179	194	165	206	5.7	7.1	73.0	.88	27.0	1.28	.99	162	.041
C., M., St. P. & P.	185	162	133	184	241	181	8.1	6.1	17.8	.44	82.2	1.23	1.09	263	.093
C., St. P., M. & O.	255	201	152	164	146	184	4.9	6.2	26.9	.51	73.1	1.02	.88	129	.044
D., M. & N.	160	11	38	62	52	65	1.8	2.2	30.7	.60	69.3	1.69	1.36	71	.044
D., S. S. & A.	214	157	155	161	203	178	7.1	6.1	100	.49	..	..	.49	99	.077
D., W. & P.	321	246	270	375	369	316	12.3	10.5	100	.52	..	..	.52	193	.107
G. N.	168	140	40	110	104	112	3.3	3.5	4.1*	.44	95.0*	1.10	1.07	112	.036
Green Bay & West.	300	268	328	340	417	331	14.8	11.8	86.1	.67	13.9	1.40	.77	322	.230
L. S. & I.	150	105	148	186	198	157	7.0	5.3	100	.59	..	..	.59	117	.163
M. & St. L.	102	101	88	104	136	106	4.5	3.5	64.5	.69	35.5	1.15	.85	116	.071
M., St. P. & S. S. M.	173	164	169	158	179	169	6.1	5.8	53.6	.53	46.4	1.15	.82	146	.077
N. P.	103	101	97	82	91	95	3.2	3.3	4.3	.48	95.7	1.05	1.02	94	.037
O., W. R. R. & N.	98	65	84	119	130	99	4.5	3.4	2.6	.38	97.4	.89	.88	115	.041
Spokane Int.	326	367	263	313	300	314	10.6	11.1	100	.41	..	..	.41	123	.131
S., P. & S.	216	174	154	142	130	163	4.3	5.4	97.9	.57	2.1	1.29	.58	76	.035
Central Western Region:															
Alton	241	213	203	263	247	233	8.2	7.7	91.8*	1.03	7.9*	1.56	1.08	266	.067
A., T. & S. F.	111	78	77	97	108	94	3.6	3.1	†	.63	100	1.09	1.09	118	.035
C., B. & Q.	134	106	64	91	120	103	3.9	3.3	..	..	91.8*	1.22	1.22	146	.045
C., R. I. & P.	106	38	46	61	69	64	2.3	2.1	0.1	.45	99.9	.89	.89	61	.022
C., R. I. & Gulf	98	44	55	70	73	68	2.4	2.2	1.4*	.88	84.4*	1.49	1.48	109	
C. & S.	116	112	110	144	133	123	4.4	4.0	42.5*	.40	54.0*	1.19	.84	112	.050
D. & R. G. W.	162	130	129	167	134	144	4.3	4.6	0.8*	.20	77.9*	.97	.97	129	.048
D. & S. L.	130	123	201	191	315	192	10.3	6.3	56.5	.69	43.5	1.17	.90	284	.131
F. W. & D. C.	90	68	31	33	46	54	1.5	1.8	..	..	92.9*	1.07	1.07	49	.022

See footnotes, page 315.

Crosstie Renewals, 1935 (continued)

Road	Number of wooden cross tie renewals per mile of maintained track						Per cent wooden cross tie renewals to all ties in tracks		Wooden ties untreated (U)		Wooden ties treated (T)		Weighted average cost per wooden cross tie	Cost of wooden cross tie renewals per mile of maintained track	Cost of wooden cross tie renewals per thousand equated gross ton-miles
	1931	1932	1933	1934	1935	5 year average	1935	5 year average	Per cent applied	Average cost	Per cent applied	Average cost			
Central Western Region (Continued):															
L. A. & S. L.	124	112	137	166	155	139	5.5	5.0	1.1	$0.65	98.9	$0.99	$0.99	$153	$0.032
Nev. Nor.	133	134	117	129	132	129	4.6	4.5	100	.82	..	..	.82	108	.220
Northwest. Pac.	210	106	76	136	73	120	2.5	4.1	100	.60	†	.90	.60	44	.021
O. S. L.	111	59	75	108	120	95	4.3	3.4	0.7	.51	99.3	.95	.95	114	.036
St. J. & G. I.	124	69	97	165	209	133	7.1	4.5	..	..	100	1.86	1.86	389	.097
San Diego & Ariz. East.	90	84	113	146	143	115	4.9	3.9	89	.92	11	1.30	.96	138	.168
S. P.-Pac. Lines	137	97	57	65	62	84	2.1	2.8	18.3*	.76	76.2*	1.15	1.07	67	.015
T., P. & W.	166	155	212	256	230	204	7.2	6.4	12.4	.76	87.6	1.37	1.30	298	.132
U. P.	108	85	86	126	144	110	5.1	3.9	†	.87	100	1.25	1.25	180	.025
Utah	187	110	94	166	272	166	10.5	6.4	38.9	.67	61.1	2.06	1.52	415	.143
Western Pac.	261	199	277	274	295	261	10.1	8.9	100	.65	..	..	.65	192	.042
Southwestern Region:															
Burl.-Rock Island	145	22	27	56	54	61	1.7	1.9	..	..	100	.77	.77	41	.022
Fort Smith & West.	241	254	203	287	238	245	7.6	7.8	100	.47	..	..	.47	111	.104
Fort Worth & Rio Grande	118	156	228	144	112	152	3.5	4.8	92.7	.74	7.3	1.23	.78	87	.106
Gulf Coast Lines.															
B., S. L. & W.	115	58	76	110	92	90	3.1	3.0	..	..	100	.94	.94	86	.028
N. O., T. & M.	126	93	113	104	107	109	3.5	3.5	..	..	100	.96	.96	102	
St. L., B. & M.	60	28	30	45	66	46	2.2	1.5	..	..	99.7*	.88	.88	58	
S. A., U. & G.	225	132	94	77	96	125	3.3	4.3	..	..	100	.94	.94	90	
Int. Great Northern	167	93	123	112	115	122	3.9	4.1	..	..	100	.89	.89	103	.031
K. C. S.	147	143	121	109	102	124	3.2	3.9	†	.51	100	.99	.99	101	.036
K., O. & G.	107	92	137	208	240	157	7.6	4.9	0.2	.10	99.8	.99	.99	237	.115
L. & A.	253	184	251	251	230	234	7.3	7.4	53.4*	.51	46.5*	.70	.60	137	.069
L., A. & T.	309	242	416	354	426	349	13.3	11.1	98.2	.46	11.8	.92	.52	220	.146
Mid. Val.	112	76	94	97	86	93	2.7	2.9	0.3	.59	99.7	.99	.99	85	.098
Mo. & Ark.	240	178	216	327	227	238	7.3	7.7	100	.44	..	..	.44	100	.101
M.-K.-T.	93	120	99	127	125	113	4.0	3.6	14.4	.72	85.6	1.06	1.01	127	.039
M. P.	164	96	164	169	218	162	7.0	5.2	12.4	.52	87.6	.94	.88	193	.048
Okla. City-Ada-Atoka	108	97	42	119	127	99	4.1	3.2	80.8	.48	19.2	1.21	.62	79	.135
St. L.-S. F.	124	167	204	202	215	182	6.8	5.8	4.4	.51	95.6	1.05	1.03	220	.081
St. L., S. F. & T.	133	164	278	427	380	276	12.0	8.7	38.2	.71	61.8	1.19	1.01	383	.273
St. L., S. W.	92	78	57	72	68	73	2.1	2.3	0.5*	.35	69.3*	1.14	1.13	77	.024
T. & N. O.	139	99	87	121	66	102	2.4	3.8	5.1	.87	94.9	.74	.75	49	.019
T. & P.	107	54	69	78	88	79	3.0	2.7	†	.96	100	.84	.84	74	.018
Texas Mexican	184	152	124	152	197	162	6.8	5.6	..	..	91.5*	1.03	1.03	202	.161
Wich. Falls & Sou.	224	176	158	172	133	173	4.0	5.2	..	..	100	.93	.93	124	.210
Canadian Roads:															
C. N. R.	..	..	164	198	..	189	..	6.6	65.5	.53	34.5	1.34	.81	180	..
C. P. R.	..	..	161	166	..	172	..	6.0	46.7	.52	53.3	1.12	.84	135	.06
Temiskaming & Nor. Ont.	..	..	216	245	..	249	..	8.6	100	68.54	..	..	68.54	156	7.7

* Owing to the fact that the total number of ties inserted on some roads included some second-hand ties, ties other than wood, tie blocks, etc., the percentages of treated and untreated ties do not total 100 per cent in all cases.

† Proportion is less than 0.1 per cent.

Note: Statement applies to Class I roads and includes consolidated data for Class I roads merged during the period 1931 to 1935, as follows:
Baltimore & Ohio—includes Buffalo, Rochester & Pittsburgh and Buffalo & Susquehanna.
New York Central—includes Ulster & Delaware.
Pennsylvania—includes West Jersey & Seashore up to and including 1932.
Penna.-Reading Seashore Lines—includes Atlantic City and West Jersey & Seashore; organized as Class I road in 1933. Figures shown are for Atlantic City R.R. only, 1931-1932 inclusive.
Gulf, Mobile & Northern—includes New Orleans Great Northern.
Duluth, Missabe & Northern—includes Duluth & Iron Range.
Atchison, Topeka & Santa Fe—includes Panhandle & Santa Fe and Gulf, Colorado & Santa Fe.
Kansas City Southern—includes Texarkana & Fort Smith.
Canadian National Rys.—includes lines in New England, Grand Trunk Western, and Duluth, Winnipeg & Pacific.
Canadian Pacific—includes all lines.

a Not a Class I road prior to 1932.

* * *

The Railroad Exhibits Are Popular at the Texas Centennial in Dallas—A Group of Springfield (Mo.) Citizens Visiting the Frisco Exhibit

Railroad Retirement Act Is Unjust to Younger Employees

No fair or logical relationship between contributions by employees and payments they will receive

By E. F. Hull

WHILE the possibility remains that all or part of the Railroad Retirement Act of 1935 may be sustained by the courts, this act merits careful study by all employees—and particularly the younger employees—to see whether it really serves their interests. First, to review the main provisions of the act:

The act provides a pension at age 65 for employees with 30 years' service. For example: $75 per month, based on an average salary of $150 per month; $90 per month, based on an average salary of $200 per month. Smaller pensions, at age 65, are provided for employees with less than 30 years' service, and for those retiring between ages 50 and 65 with 30 years' service. A disabled employee may retire at any age on full pension, provided he shall have completed 30 years of service. Income over $300 per month is not taxed or recognized in determining the pension.

The 7 per cent tax bill (3½ per cent income tax on the employee and 3½ per cent excise tax on the railroad which for the time being have been enjoined by the court) was designed to provide the necessary funds. The tax act expires February 28, 1937. However, we have no reason to believe that the subsequent tax bills will provide a lower rate. These taxes are to be paid into the United States Treasury and the payment of pensions is dependent upon appropriations from time to time by Congress. There is no "pension fund," although I shall use the term "fund" to indicate the amount which should have accumulated to the credit of the employee. The act is to be administered by a board of three members with salaries of $10,000 each and a clerical staff.

No Protection for Dependents

An employee, starting at age 20, with an average salary of $150 per month during his period of employment, will pay an average tax of $63 per year for 45 years (if the act is sustained by the Supreme Court). This would total $2,835. The $63 per year, at 3 per cent interest compounded annually, would build up a fund of $6,007. Doubled by the railroad company's contribution, the fund to his credit at age 65 would be $12,014. If death should occur at age 65, his widow will receive $37.50 per month *for one year only,* a total of only $450. The balance of the $12,014 fund, i.e., $11,564, will be retained by the U. S. Treasury and cannot be recovered by either the widow or the railroad company.

If he should die at age 49, his widow and children, who, with him, have sacrificed for 29 years to build up a "social security" protective fund of $5,826 as required by the act, may be left destitute because they have no claim or title to this fund which has accumulated to his credit. The $5,826 will remain in the United States Treasury for use in paying pensions to other more fortunate employees.

If forced to retire at age 49, after 29 years of service as the result of disability, he will be without compensation or benefit from the $5,826 for 16 years, if he lives that long. He may receive a pension of $72.50 per month, based on 29 years service if and when he reaches age 65. He can leave the railroad after 30 years service at age 50, go into business until 65, and draw the same pension at 65, as the man who started at the same time and age, remained in railroad service 45 years until 65, paid $63 per year tax for 15 more years, and whose fund will be $2,413 greater than his own.

The young woman, starting at age 20, average salary $100 per month, who leaves the service at age 30, having a fund of $991 to her credit, will not receive any refund when she leaves. No refund will be made if she dies prior to age 65. If she lives beyond age 65, she may receive a pension of $17.50 per month. Any service over 30 years is not recognized in calculating the amount of the pension, but the tax must be paid for the entire service period which will average around 45 years.

The Eleventh Hour Laborer Receives His Penny

The employee who pays the tax from age 35 will actually contribute $1,890 and would have a fund of $6,174 to his credit. Compare this with the tax paid by the employee who starts at age 20. Each would receive $75 per month at age 65.

There is no fair or logical relationship between total contribution, length of service and the amount of the pension. The obvious discrimination against the young employee becomes more apparent as we analyze the figures for present-day employees, ages 40, 50 and 60. For example: the employee age 60, with 25 or more years service, present salary $200 per month (30 years' average $150), will only pay $420, and have a fund of $919 to his credit at age 65, yet he, and the employee with the same average salary, who retires in 1936 at age 65, having paid only a few dollars tax, will each receive a full pension of $75 per month. Obviously, the young employee in the lower salary bracket, who can ill afford it, will be carrying the load.

Insurance a Better Bargain for Young Employees

A non-contributory and more attractive pension system, based on full service and the average salary for the last ten years is efficiently administered by the Southern Pacific Company at a cost, to the company, of 2.4 per cent of the payroll. The Retirement Act will take 7 per cent of the same payroll, representing an increase in cost of 180 per cent over the cost of the company's plan, i.e., $2.80 Retirement Act cost vs. $1 corporate cost.

Standard life insurance companies, engaged in the profitable business of guaranteeing life annuities and insurance, now provide various plans for old age retirement, far superior and less expensive than this compulsory contributory Retirement Act. For example,

(*Continued on page 319*)

In the Rail Yard of the P. & P. U.

Neatness Marks Supply Work of the P. & P. U.

New materials for repairs to foreign cars also stressed in switching company's operations

THE Peoria & Pekin Union is an example of companies which have taken an interest in purchasing and handling of materials and have for years observed practices directed to obtain economical results with the limited resources available for the purpose.

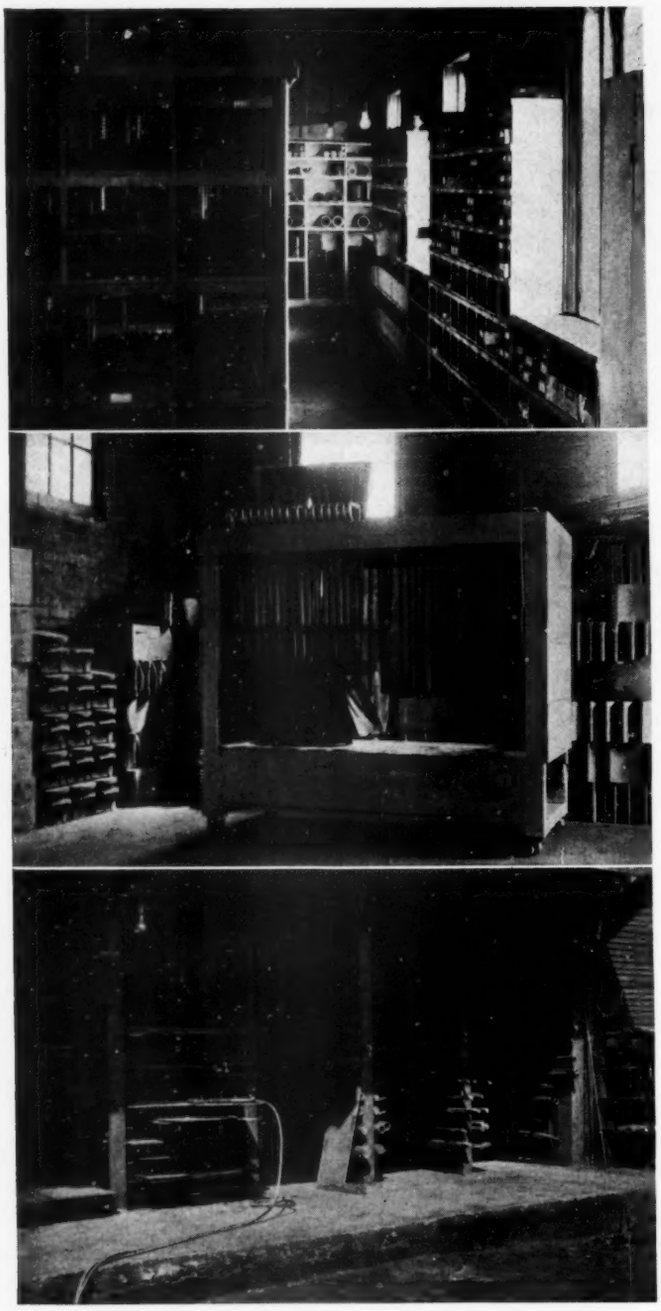
In the Maintenance of Way Yard—Note Use of Old Coaches for Inside Materials

Besides operating the principal passenger station at Peoria, Ill., a city of 135,000 population, and providing the main or only rail connection for many industries located there, the road is an intermediate switching line between the Peoria & Eastern, the New York Central System, the Illinois Central, the Pennsylvania, the New York, Chicago & St. Louis, the Chicago & Illinois Midland, and the Chicago & North Western, joint owners, and also the Alton (tenant), the Atchison, Topeka & Santa Fe, the Chicago, Burlington & Quincy, the Chicago, Rock Island & Pacific, the Illinois Terminal, the Minneapolis & St. Louis, the Toleda, Peoria & Western, and the Inland Waterways Corporation.

The facilities include 160 miles of tracks, including 10 miles of double track with centralized traffic control to Pekin, Ill., and 24 switch engines, including a 600-hp. Diesel-electric unit installed last April. Approximately 2,500 cars are switched a day, and light repairs are made to approximately 2,400 foreign cars a month. The road also performs running repairs to locomotives of owner lines and tenants. Its many tracks are laid almost entirely with 90-lb. rail, and with treated crossties, fully plated. Beginning this year, all purchases of switch ties and plank are also restricted to treated material.

Turnover Above Average

The volume of materials involved in supply work is reflected by the figures for 1935 when the consumption totaled $479,000, including $123,000 of fuel, $15,000 of ties, $4,000 of rail and $335,000 of miscellaneous material. Materials in stock at the close of the year amounted to $131,000, including approximately $15,000 of rail, $7,000 of ties and $104,000 of miscellaneous materials. Based on the average consumption of materials during the year, the inventory represents a 9 day's supply of fuel, a 5.8 month's supply of ties, and a 3.7 month's stock of miscellaneous material. The average



Top to Bottom—Locomotive Stores. Portable Rack for Brooms and Shovels. Iron Rack

turnover of miscellaneous stock by all roads in the United States in 1935 was 4.7 months.

Supplies for locomotives are stored in part of a new brick building adjoining the roundhouse, in charge of a storekeeper reporting to a supervisor of stores who reports to the purchasing agent. Materials for car repairs are stored in a supply yard about one mile distant where another storekeeper, likewise reporting to the supervisor of stores, is on duty. Track and bridge and building materials are in charge of the chief engineer, and, for the most part, are centralized. Supplies for signals and interlockings are in charge of a signal supervisor.

With the exception of the brick storehouse for locomotive supplies, the buildings are old structures of frame, and several passenger car bodies are utilized for storing finished lumber and small track and bridge materials. Both maintenance of way and equipment stocks are marked by the orderly arrangement and the attention given to adequate protection from loss and spoilage. In the locomotive store, open-type shelving and trays are much in evidence, and all small items are stored in a proportionately high number of pull drawers and boxes arranged in uniform tiers from floor to ceiling. Shovels, brooms and similar material are stored compactly in a rack built on castors so that it can be moved to permit easy access to other material stored in the same room. Sections of rail in a concrete platform under a roof hold bar and sheet steel and lumber, while oil is drawn directly from shipping drums which are placed on tumbler racks until empty. All shelving is painted white. The maintenance of way material yard is dry, free from weeds, and dressed with tailings; and all outside material is well ventilated.

The mechanical stocks are considered too small to require stock books, and a complete record of the material is carried only once a year when the accounting forces take annual inventory. The paper work is simple but well organized, to protect the company from errors in billing foreign lines for repairs. Material may not be removed from stock without requisitions signed by car shop or roundhouse foremen or other authorized persons. Materials issued each day for the same account are reported by the storekeeper on a requisition form in advance with descriptions on the bin labels. Material received for credit is reported at the bottom of this form. The forms are numbered consecutively. From the stores department they are taken to the accounting department where they are priced and extended, the storekeepr retaining a carbon copy in book form.

For the purpose of replenishing stock or obtaining special material, requisitions are made on the purchasing

Left to Right—Finished Car Lumber Stored in Old Passenger Coach. Car Material Store. Tiers of Drawers in the Locomotive Stores for Small Items

department once a month, or oftener if necessary, by means of a form on which the storekeeper shows the quantity of each item required and its purpose; the items are listed consecutively without regard to classes.

Orders on which materials are purchased are made in triplicate. The original is 6 in. by 11 in. and shows the purchasing department order number and the storekeeper's requisition number, with printed instructions at the bottom requiring invoices to be submitted in triplicate on the national standard simplified invoice form giving the number of the purchasing order and the discounts allowed for cash payments. A copy of this form is made on unruled green-colored paper for the storekeeper, and a third copy, measuring 8½ in. by 11 in., is prepared on a ruled paper, with the right-hand margin arranged to serve as a receiving record for the purchasing office.

When material is received at the storehouse, the storekeeper prepares a receiving record on a blue form showthe car number, date, place of unloading and the amount and kind of material, together with the order number and the name of the shipper; and these records are filed with the purchasing department as orders are filled, whereupon the storekeepers are at liberty to destroy their copies of requisitions and purchasing orders.

Supplies in the maintenance of way yards are replenished by orders prepared by the chief engineer and the purchasing department in the same manner as for the mechanical supplies. However, no one is employed on a full-time basis in the material yard. The stores of small materials are locked, except when material is received or shipped, under the direction of the track supervisor, and requisitions are furnished by him to the chief engineer covering material withdrawn by section foremen. Withdrawals are accounted for by section foremen in their daily reports to the chief engineer, and the consumption of material is entered in a journal providing a separate record for each kind of material and showing in progressive form the quantity on hand, the amount received, the withdrawals and the balance. It is a simple matter for the maintenance of way department to ascertain with this record the status of stock at any time.

Purchases which cannot be filled promptly and economically by responsible firms located in Peoria are placed with established railway supply firms of good reputation. Only new material is purchased for application to foreign cars. With few cars of its own, the road is not confronted with the problem of utilizing salvage from dismantled equipment, but it is also understood to have consistently declined to be used as an outlet for similar materials produced on the parent roads. This simplifies the accounting with foreign lines for car repairs, and insures the road against complications growing out of delays or other trouble attributed to material failures on cars repaired at Peoria.

No Surplus

The impracticability of reducing the large number of special turnouts in the switching district requires the road to keep a large protective stock of frogs. The rail inventory has been greatly reduced, however, by increasing uniformity in the weight of rail; and the use of a self-guarded frog throughout the terminal has almost eliminated the use of guard rails and auxiliary fastenings. What was once a troublesome switch problem has also been subjected to satisfactory control by having a commercial plant convert switches worn out in long turnouts to switches suited to short turnouts. Surplus and obsolescence in mechanical stocks are almost entirely avoided by stocking only A.A.R. standard car parts, as described in the interchange rules, and requiring car owners to furnish special items from their own stocks when occasional needs for such material for cars or locomotives arise. The success of the road in avoiding delays to cars caused by material shortages is indicated in part by a recent check of 2,000 car movements, which showed an average detention of cars in the terminal of only 3.8 hrs.

Retirement Act Unfair

(*Continued from page 316*)

Male, age 20: the $126 annual tax paid for the $75 per month Retirement Act pension. would pay the premium on a guaranteed life income of $110.67 per month for him at age 65, or, $83.15 per month for him and $83.15 per month for life for the surviving widow. ($83.15 based on the assumption that they are of the same age, because the figure varies slightly with age relationship.)

Again, $126 per year would buy a guaranteed "cash refund annuity," providing a monthly income of $87.91 for life at age 65. At death, if after 65, the difference between the amount of income received and the maturity cash value to be paid to his heirs. If he elects, he will be paid the full maturity cash value of $13,038 at age 65.

No "Cash Value" to Tax Payments

Each of these policies has a cash value. For example: $8,158 at age 55; $10,390 at age 60; and $13,038 at age 65, and they each provide for the return of all premium deposits, or the cash value, whichever is the greater, to his dependents, if he does not survive to age 65. *The Retirement Act does not provide for a cash value at any time.* The sum of $85 per year would pay the premium on a guaranteed pension of $75 per month at age 65. This would also have a cash value.

If the employee, starting at age 20, leaves the railroad service after 10 years, he could take a commercial policy with him. It would be a written contract, something tangible, giving a sense of security and not dependent upon unforeseen conditions or future acts or appropriations of Congress. However, with the 3½ per cent income tax burden, he cannot afford a sufficient amount of guaranteed commercial protection and he cannot take his railroad Retirement Act fund or plan with him when he leaves. If he then desires a commercial policy, the premiums, during the ten-year period will have advanced approximately 40 per cent (age 20 vs. age 30) and it is little consolation to him then to hope that 35 years later, at age 65, he may receive his "Railroad Retirement Act" pension of $25 per month.

The adoption of the Retirement Act was most unfortunate, for it is discriminatory, confiscatory, impractical, costly, fundamentally unsound and utterly devoid of any "security." There is no guarantee or certificate. The rates and provisions can be changed at will by Congress. One wonders whose welfare was in mind when it was drafted. Certainly not that of the young employee of today or the future.

The Supreme Court has thwarted one attempt at this sort of interference. However, the same bill, changed but more vicious is now the "Retirement Act of 1935." Employees should not ask the courts always to guard and preserve our rights in this matter, but should make use of the more logical remedy, i.e., an attack at the source by a direct appeal to our Congressmen and the employees representatives responsible for the framing of this act, for, if declared invalid, we may expect another attempt unless the offensive nature of the act is clearly impressed upon them.

Hardin Assumes Presidency of Chilled Car Wheel Association

Former assistant to the president of New York Central succeeds J. A. Kilpatrick

FRANK H. HARDIN, whose election to the presidency of the Association of Manufacturers of Chilled Car Wheels to succeed J. A. Kilpatrick was announced in the *Railway Age* of July 25, will assume the duties of that office on September 1. Mr. Hardin thus becomes the chief executive of an important supply trade organization after a 27-year railroad career—all with the New York Central in the service of which he rose from special apprentice to assistant to the president, the position he occupied at the time of his resignation.

Blank & Stoller

F. H. Hardin

Mr. Hardin was born in Gainesville, Ga., on June 14, 1886, and in 1908 he was graduated from the Georgia School of Technology with a degree of Bachelor of Science in Mechanical Engineering. After postgraduate work at Columbia University, New York, Mr. Hardin entered railroad service in 1909 as a special apprentice on the New York Central. As stated at the outset his entire railroad career has been in the service of that road. From 1912 until 1914 he was successively assistant engine house foreman and engine house foreman; and during the three following years, until 1917, he was special engineer to the office assistant to the president. In 1917-18 Mr. Hardin was master mechanic at Utica, N. Y., becoming in the latter year assistant to the federal manager, a position which he retained until 1920. Next he was chief engineer of motive power and rolling stock, a position which he held until 1926, the year of his appointment as assistant to the president. Mr. Hardin has been a member of the General Committee of the Mechanical Division, Association of American Railroads, continuously since 1924. He is a member of the American Society of Mechanical Engineers.

The Association of Manufacturers of Chilled Car Wheels was described in 1933, at hearings preliminary to its designation as the N.R.A. code authority for its industry, as an organization representing 86 per cent of that industry. E. P. Waud, vice-president of the Griffin Wheel Company and a member of the Association's board of directors, there testified that approximately 90 per cent of the country's rail-borne commerce was moved on wheels produced by firms for which he spoke. These firms, some 20 in number, now operate 52 foundries—44 in the United States and 8 in Canada. Their total invested capital was given by Mr. Waud at the 1933 code hearings, as $40,000,000; they normally employ 4,500 persons and are capable of producing 6,000,000 wheels a year.

The Association was formed in 1909 with its object set forth in the by-laws as follows: "The advancement of knowledge concerning the manufacture and service of car and locomotive wheels, by discussion in common investigation and reports of the experience of experts and of members of the Association. The obtaining and disseminating of information as to the manufacture and service of car and locomotive wheels."

The set-up was further explained by a former president of the Association, the late George W. Lydon, who, in a pamphlet published several years ago, emphasized that "We have no economic compact—our sole and only purpose is defined in the by-laws. We have worked through the Master Car Builders' Association, the American Railway Engineering Association, the Bureau of Standards, Washington, D. C., and have encouraged the study of the chilled iron wheel through the universities."

More recently, in a presentation last February before the Eastern Car Foreman's Association, the Association's vice-president in charge of research—F. K. Vial—discussed the organization's present research set up. "The Association of Manufacturers of Chilled Car Wheels," Mr. Vial said, "has established a complete, modern laboratory for the purpose of investigating all problems of a metallurgical and technical nature." He then proceeded to describe this laboratory with its "considerable equipment and instruments of precision" as he led up to the following brief outline of the prospectus of the Association Research Department's work:

First: Definite programs of research, such as the study of heat treatment, the study of the effect of varying the normal elements in the metal, and the investigation of individual and combinations of alloys in wheel iron.

Second: The investigation of individual wheels sent in by wheel manufacturers and also by the railroads. The study of wheels from the individual manufacturers

(*Continued on page 324*)

Progress in Simplification of Tariffs*

Simple and concise tariffs obtainable without radical readjustments and without loss of revenue

By J. G. Kerr
Assistant to Vice-President, A.A.R.

THE National Tariff Simplification Committee was created by the Traffic Advisory Committee of the Association of American Railroads in December, 1935, and is composed of the principal tariff publishing agents of the country, with George M. Crosland of the Interstate Commerce Commission sitting with the committee as an observer. While we have been in existence but six months we have been diligently at work developing from the everyday users of tariffs—both shipper and railroad—the practical difficulties encountered, and of devising ways and means of improving the tariffs so far as such is within the power of the tariff publishers.

We can report real progress towards tariff simplification but it is too much to expect that we can overnight revolutionize present practices. As new tariffs are issued or old ones reissued what we have developed will be taken advantage of, with the result that gradually it will be easier to ascertain rates and those factors which now cause the greatest difficulties will to the fullest extent possible be rectified. From the very nature of our problem our work must be a continuing one, an approach to perfection which as is said in mathematics will be reached only in infinity; however, constant improvements may be expected.

Even before our Committee was created, groups of carriers throughout the country were becoming "tariff minded" and were accomplishing worthwhile results in the way of more simple tariffs. You are beginning to get the benefit of this constructive thought, for much of which our Committee as such can claim no particular credit. We do have the means of spreading to all parts of the country the improvements developed in any section, to co-ordinate the efforts of all sections, as well as to initiate reforms of our own. The committee is greatly appreciative of the help it has received from the accounting officers.

"A Sad Commentary on Traffic Departments"

No one can read or digest, as I have done, this great mass of data without being impressed—indeed shocked by—the great waste of time, which in the aggregate is of staggering dimensions, which arises from the inability of rate clerks in the agency, accounting, and quotation offices of the railways, and of those employed by shippers, quickly and accurately to determine the rate applicable to a given shipment. While there are extenuating circumstances—many of them quite beyond our control—as a traffic officer I am frank to say it is a sad commentary on the traffic departments that we have permitted such a condition to be brought into existence or to continue, especially when we are faced on all sides with the strongest kind of competition from other forms of transportation.

It is up to all of us who are in any manner responsible for existing conditions frankly and fearlessly to face the facts as they actually exist and to find ways and means, even though we have to resort to major surgery, to correct the evils that are now present in our freight rate structures and tariffs. While there are many who say you cannot do this or that and some who assign a thousand and one reasons for maintaining a practically static position, I am far from alone in my opinion that it is not only possible to simplify the rate structures, including the classifications and their exceptions, with resultant simple and concise freight tariffs, but that this objective can be attained without radical readjustments of rate levels either territorially or by commodities or by any sacrifice of revenues.

Co-ordinator's Scheme "Fantastic"

While our committee will do all it can to improve existing tariffs, no amount of ingenuity on the part of the tariff publishers will produce simple tariffs so long as we are faced with highly complicated rate structures, particularly in respect of interterritorial rates. Let no one for a moment feel that the Federal Co-ordinator has "sold" me the fantastic suggestions contained in his Freight Traffic Report, namely, to separate all commodities into six arbitrary commodity groups—Rough Material, Raw Material, Semi-processed Material, Necessaries, Auxiliaries, and Accessories, coal being grouped with live stock and strawberries under Raw Material at the same base rate; to divide the country into about 60 rate blocks or zones approximately 60 miles square; to devise scales on each commodity group to apply from group to group; ending up with the statement:

> With these major difficulties overcome, the tariffs covering all rates on all commodities in the United States can be simply and concisely stated within the bounds of a single volume.

Apparently the idea was to let the chips fall where they will regardless of the needs of commerce or the ability of traffic freely to move on rates so made.

I prefer to approach the handling and disposition of this problem not on basis of theory or fantasy but in a practical and common sense manner. Freight rates and tariffs that look merely "pretty" but will not freely move traffic and produce adequate revenues are worthless for any purpose. We are confronted with stern practical realities and not theories. I shall undertake to mention only a few of the principal causes of complicated tariffs with an occasional comment:

Causes of Complicated Tariffs

1. Differences in classification ratings, including the so-called "exceptions," also, the varying percentage relationships to first class assigned to other classes and commodities, one territory vs. another.
2. Lowest combination of local or proportional rates as maximum, also so-called "bridge" scales as maximum.
3. Border gateway rates as minimum to points beyond.
4. Farther distant point rates as maximum.

Up to a few years ago it was a comparatively simple task to construct interterritorial rates by combining the rates on one side of the gateway or gateways (usually

* Abstract of an address delivered at the annual meeting of the accounting officers, at Detroit.

limited in number) with the rates on the other side. When one-figure through rates were prescribed based on distance or some other formula and governed by a certain classification, theoretically it appeared that the applicable rate could be obtained more easily than by figuring the lowest combination. But, what actually happened was that there were superimposed upon this through one-figure plan other and somewhat numerous qualifying bases such as lowest combination as maximum, bridge scales as maximum, farther distant rates as maximum, or border rates as minimum, to say nothing of the "exceptions" to one of the classifications, frequently providing different ratings as to the through traffic than as to one of the factors. The existence of many so-called "truck-competitive" rates has further complicated the situation.

We have received many suggestions that the applicable rate should be determined and published as the going rate. I have no quarrel with a suggestion of this sort if it would provide the proper remedy. If we had but a few points and rates to deal with, such a task would be an easy one but when we are dealing with thousands of articles and hundreds of thousands of origins and destinations it becomes one of Herculean proportions, and simple tariffs will not be the result—to say nothing of the difficulty of keeping the through rates revised so as to reflect the constantly changing factors which go to make up the combinations, bridge scales, etc., where such are observed as maximum or minimum.

First Class in West, One-Half to Twice That in East

To illustrate, notwithstanding the serious efforts that have been made to bring the three major classifications closer together as to ratings, there are still thousands of differences one territory vs. another, some of quite radical character. There are 320 items rated first class in the Western Classification alone which are rated either higher or lower than first class in the Official Classification, ranging from 2 times to 50 per cent of first class. And so it is with other classes and with the other territories. The numerous exceptions ratings and commodity rates and scales are in the same category.

The through one-figure rates may be fairly stable except to the extent they may change by reason of revised classification ratings, but the factors which go into the combinations, bridge scales, border rates, etc., are not so stable. To search out and publish as the going one-figure through rates on each and every article of commerce between every possible origin and destination to reflect these maximum or minimum bases is an almost impossible task and, even if possible, we would have a hodge-podge of tariffs, probably unintelligible to the average user.

To continue the list of reasons for complex tariffs, we find:

5. Excessive supplemental matter.
6. Partial cancellation of tariffs.
7. Ambiguous commodity descriptions.
8. Routing instructions and guides.
9. I.C.C. decisions and rulings.
10. Complicated rate structures.
11. Intermediate rule application.
12. Mileage scale rates and distance tables.
13. Alternating or temporary rates—including state vs. interstate, and varying rates and minimums.
14. Too many tariffs.
15. Reference marks and symbols.
16. General make-up of tariffs.

As an example of what has been and may be accomplished in the direction of material tariff simplification by slight modification of rate structures, careful consideration of tariff construction, and above all a firm purpose to do something, I call your attention to the new class rate tariffs published between points in the South, 10 in number, effective June 1, 1936. These tariffs also apply on many commodities definitely related to the first class rates by percentage.

These tariffs incorporate a new system of rate groupings, reduced in number from 2,450 to 1,075, and which for the first time are standard regardless of the direction of movement of the traffic. In other words, Podunk will take, say, Atlanta group rates regardless of the origin or destination. These new groupings represent the selection of centrally located stations, usually the more prominent points, and the grouping therewith of stations on either side within a distance of 20 miles of the base point.

All stations are published in a separate but concise "rate basis" tariff with reference to rate basis (the station name) applicable, but as the rate tariffs themselves show as head-line and side-line points the stations to and from which probably 90-odd per cent of the traffic moves, and, as stated, Podunk will always take Atlanta rates, the constant user will not often have to refer to the rate basis tariff.

Saving 7,259 Pages in One Set of Tariffs

The aggregate number of pages in the old class rate tariffs was 10,059. The new tariffs aggregate not to exceed 2,800 pages, a decrease of 72 per cent, a most remarkable thing when very simple tariffs were also the result. Simplicity was not sacrificed for reductions in pages and printing costs. In these 10 new tariffs the publication of distance or point-to-point rates as such was discontinued. All points within a single group, the maximum haul being about 40 miles but the average weighted haul being under 20 miles, take one single basis of rates, namely the 10-mile scale. In like manner, from all points in one group to all points in another group, whether it be one adjoining or far distant, take a single basis or scale of rates, which is based on the short-line distance between the pivotal or key points in each group. This represents a very simple way of stating rates and greatly reduces the aggregate number of rates.

The tariff and supplements applying between points in Georgia and from Georgia to all other Southern stations prior to June 1, 1936, and the new tariff effective on the latter date are fairly typical. The old tariff proper contained 1,270 pages, and including those in effective supplements, totaled 1,904 pages. The new tariff contains only 284 pages. One supplement alone to the old tariff contained 249 pages or only 35 pages less than the total pages in the new tariff. The old tariff contained six alternating sections while the new has only three.

In the new tariff all rate basis numbers between any two points, whether normal, minimum, or otherwise, are found at the same place and by one operation. The rate basis numbers assigned to "minimum" rates are uniformly designated by a letter "O" prefix, thereby definitely flagging for the tariff user those rates as to which a minimum basis may come into play. Coupled with this, a non-application rule, an innovation, is provided to cover classes and commodities as to which it is known that the minimum provisions are not applicable, making a detailed check thereof unnecessary.

The new tariff shows the first 12 classes separately from the percentage columns, and each fourth column of rates is separated by a heavy line. When the tariffs are next reissued, the heavy line will separate each third column in accordance with a suggestion submitted by a number of accounting officers.

The old tariff showed the origin head-line points to

the group points in each state separately, the origin points starting all over again with each destination state, resulting in any given origin occupying a different place in the head-line set-up according to the destination state and the origins being scattered throughout the tariff. The new tariff shows the origins by groups of 15 to the page and the destinations thereunder to *all* the states, and then after covering all of the states starts over again with a new group of 15 head-line origins. Generally speaking, rates are checked from one origin to a number of destinations rather than from a number of origins to one destination. The new plan therefore makes for greater utility by merely reversing the old process. In the new Georgia tariff, Atlanta uniformly appears as the eighth head-line point on pages 29 to 50 which pages show the rate bases to all stations in the South. A shipper or railway clerk rating freight from Atlanta has his bases shown uniformly in the eighth column and on a limited number of pages instead of in varying columns scattered through the tariff as heretofore. His direct interest in the tariff is therefore limited to a small portion of the tariff.

User's Convenience First Consideration

The user's convenience has been kept uppermost in mind, demonstrated, to use one simple illustration, by the fact that in the old tariffs the rules and regulations were spread completely across the pages while in the new they spread across but half the tariff page, each page containing two columns. Obviously the eye can follow the shorter line much better, and with fewer errors, than with a line running clear across the page.

Our Committee deserves no credit for what has been accomplished with these Southern tariffs; they are the work of Chairman Tilford and Agent Pope who started the work before our Committee came into existence. I have used these tariffs for illustrative purposes because they demonstrate what is possible in the shape of simple tariffs in combination with a slight modification of the rate structure by cutting off the fringes.

Another excellent example of tariff simplification is found in Southwestern Lines Tariff No. 152-D, issued by Agent J. R. Peel, effective May 1, 1936. It applies on classes and commodities between Official and Southwestern territories—a rate adjustment prescribed by the Commission which is exceedingly complicated and for this reason one that is very difficult to state in simple tariff form.

In the previous issue, reference was made to a separate publication (Territorial Directory No. 2-A) for a list of stations in Official Territory to and from which the rates applied. Instead of requiring the user also to consult this separate publication, the new tariff brings these stations into the tariff proper and they are arranged alphabetically by states. The old tariff showed the Southwestern origins and destinations alphabetically and gave reference to a separate geographical list for information as to group location. In the new tariff the geographical list was dropped and the group location is shown directly in the alphabetical index.

In connection with interterritorial rates, one of the principal difficulties confronting the publishing agents is the matter of complying with and showing the so-called minimum rate provisions—that is to say, where the local rates within Official territory to the border gateways, governed by a different classification and "exceptions—have to be observed as minimum to points beyond. This difficulty was present here, as was also the problem of joint differential rates with the barge lines determined in accordance with a rather complicated formula laid down by the Commission. The new tariff was arranged so as to show at one operation the rate bases applicable in connection with the standard or normal all-rail rates, the minimum rates, and the rail-barge-rail rates.

Thus, by removing the necessity for the tariff user referring to a separate tariff directory and by showing the complete information relating to each origin and destination in an alphabetical list so far as it may now be practically done, we have reduced to an absolute minimum the number of moves required to determine the applicable rate.

Simplification Reduces Printing Costs

In preparing this new tariff Agent Peel was more concerned with simplification than with reducing the number of pages, but regardless of the fact that he transferred from the territorial directory to the new tariff a complete list of stations in Official territory the completed work resulted in a saving of 65 tariff pages. I make this observation in answer to the fear of some people that tariff simplification may result in increased printing expenses.

To mention a typical case in Official territory, Agent Jones of the C. F. A. lines has recently issued his Tariff 535 covering reshipping or proportional rates on grain, grain products, and by-products of grain, from Chicago, Peoria, East St. Louis, Milwaukee, etc., to points in C. F. A. territory. This new tariff took over the publication of rates formerly published in 5 agency tariffs and 28 individual carrier tariffs.

Similar work is going on all over the country and I could point to many recent examples of material tariff simplification in each territory. If our Committee accomplishes nothing else, it has provided a medium for the exchange of ideas among the publishers so that each one may obtain the benefit of experiments made by others, and of stimulating co-operation between the rate-makers, the publishers, and the users.

We have perfected an excellent working arrangement with the Commission. One or more of its tariff or traffic men frequently sit with us and participate in our discussions. None of us hesitate to speak his mind where the Commission's decisions are responsible for complex tariffs, as many of them are. We have had occasion to bring these matters to the attention of the Commissioners and as a result the Commission's examiners will in the future be required carefully to consider how rates may be stated in tariffs in a simple manner when they formulate decisions and orders.

I am not one of those who blame the Commission for all of our tariff troubles because I know that the railroad rate-makers must accept a full share of the responsibility. We are, therefore, insisting that the railway rate-makers shall not merely check out some rate adjustment, however complicated, and hand it to the tariff man for publication but that they too shall think in terms of simple tariffs with the user's convenience uppermost in mind.

Simpler Expression of Existing Rates Insufficient

Our Committee has made a long list of recommendations which when finally made effective will, we are sure, materially improve the present tariff situation. Some have now been incorporated into new tariffs with much satisfaction to tariff users. But, if we stop with finding the most simple method of publishing in tariff form the rate structures as they now exist, I will feel that we have accomplished but a fraction of the savings in time and money that are possible if we should fearlessly tackle the source of the trouble.

As I have understood the task assigned to our Com-

mittee, it is not merely to find the ways and means of publishing as simply as possible that which is handed the tariff publishers, but to point out to our executives and others the real causes for the present complex tariff situation and, if necessary, present suggestions as to what may be done in the way of revising rate structures so that it will be possible to state the rates in tariffs in a simple and concise manner.

Based on many years of practical experience in railway work, I know of many tasks far easier and more agreeable than this one of tariff simplification if it is to be done in a way that will bring about real results and savings. Our suggestions and recommendations are going to meet with many criticisms, many of them sound. I am not so much concerned with constructive criticism as I am with a do-nothing attitude when so much is possible in the way of reform without a great upheaval and sacrifice of revenue.

There are some things which can only be perfected as the result of experience. We have to do some experimenting like in any other line of endeavor, one thing leading to or suggesting another, but we hope to eventually achieve what is desired, knowing full well that our task is not merely a committee job. It is one for the accomplishment of which credit will be due to the co-operation of many thousands of people, particularly the officers and rate men of the accounting and traffic departments.

Hardin Assumes Presidency

(*Continued from page 320*)

is usually for the determination of the effects of some changes in composition or method of manufacture. Those from the railroads are generally wheels which have failed in service. These are thoroughly examined and analyzed to determine the factors which may have had a weakening effect on the wheel. The information is furnished to the manufacturers with suggestions to assist in eliminating these defects.

Third: Gathering and classifying statistical information on wheel service and railroad traffic as it reflects the work performed by the wheels.

Odds and Ends . . .

Oldest Skyrider?

Richard Fennelly, Brooklyn, N. Y., aged 82, retired engineman for the New York, New Haven & Hartford, claims to be the oldest railroader in the United States ever to take an airplane ride. He received his air baptism in an open cockpit plane last month.

Railway Centenarians

There are undoubtedly a few railway veterans who have lived a century or more, but the Pennsylvania certainly has more than its share. Thomas Gallagher, machine shop foreman, who retired in 1908 and died in 1930, lived to be 102 years old, while Kirby C. Jackson, engineman, who retired in 1902 and died in 1933, lived to be 101. There is also a very much alive Pennsylvania centenarian, in the person of Joe Jones, retired supervisor of signals. Joe reached the 100-year mark on September 29, 1935, and is still going strong. Are there any other railway veteran centenarians?

A Hole in One

P. L. Martin, clerk in the office of the assistant general freight agent of the Norfolk & Western, at Columbus, Ohio, was declared champion in the recent rail employees' system golf tournament. But Mr. Martin was not satisfied by beating 187 railway golfers in 13 cities and towns on the railroad and at off-line agencies. After the tournament was over he went out to the Bridgeview course at Columbus, picked up a No. 3 iron and clipped off a hole in one. The shot was 175 yards, and gave him a score of 68 for the 18 holes, three under par.

Road's One Engine Performs Better Under Trusteeship

A locomotive that won't stay on the tracks, but which has behaved better since a trustee was appointed for its owner, now in bankruptcy, was reported to the Interstate Commerce Commission recently. John B. Bingham, court-appointed trustee of the Middleburgh & Schoharie, brought the matter to the commission's attention. Writing to inform the commission of the road's condition, he said the 5.9 miles of track, the one locomotive and a very dilapidated coach, the only rolling stock, were in bad shape. He suggested that either the track be torn up for scrap or arrangements be made for the road's operation by the Delaware & Hudson. In any event, he urged that something be done before winter because things can't go the way they are, as revenues won't pay expenses let alone taxes. He wrote the commission:

"They have as their only rolling stock a small steam engine which is about 40 years old, together with a coach which is in such a state of disrepair that it is impossible to operate it. The railway and track of this railroad is in a very bad state of disrepair and, at the time I took over the operation of this road as trustee, the train was constantly going off the track. Since that time, however, it has slightly improved."

Smallest U. S. Railroad To Show Profit

The nation's smallest railroad—13 miles long—is going to make a profit this year and settle up its debts with the government, according to Earl S. Snyder, president, conductor and engineer maintenance of way of the Pioneer & LaFayette, at Pioneer, Ohio. All this is going to happen, he predicted, despite the fact that the railroad runs only three days a week because Snyder has to devote Monday, Wednesday and Friday to his hardware business. The skies are clearing. He got an extension on his $10,000 R.F.C. loan and business is picking up. Snyder isn't a railroad man and doesn't much want to be one. He was forced into it.

The Locomotive Whistle

The railroad locomotive's voice is changing—changing at the age of a round century. Back in the days when little teakettles on wheels first began to beat the stage coach to the crossing, the stout-lunged engineer himself used to blow his own tin post horn, like generations of coachmen before him. Then in 1832 an English farmer spurned the frantic tooting of an engineer on the Leicester-Swannington railway, refused to believe that the tin horn could overtake his old gray mare, and they met at the crossing. It was, alas, an egg car. From those scrambled eggs on an English roadside came the first locomotive whistle. This new day of speech on railroads has brought more changes. Streamliners want to be recognized. They want the folks for miles around to say, "There goes The Rebel," and "Sounds like The Chief," "The streamliner's on time again," "That's the voice of The Zephyr." When a new type passenger train is roaring down on a crossing at a hundred miles an hour, it needs a healthy lung. It takes the sound of a whistle one second to reach a crossing 1,087 ft. away—and six seconds later the train is there.—Jackson (Miss.) Daily News

NEWS

Public Operation Not Popular With Business

Survey by Transportation group shows 633 commercial bodies favor private ownership

American business is overwhelmingly opposed to government ownership and operation of the railroads, according to a poll of national, regional, state and local business organizations just completed by the Transportation Conference. The report of the poll is incorporated in a volume of 740 pages, which contain photographic reproductions of declarations on the subject by 666 business organizations. A total of 633 organizations strongly endorsed the continuation of private ownership. One favored government ownership, while other organizations did not take formal action.

Among the major reasons which the resolutions raise against government control of rail transport are: The undesirability of the government operating business which can better be carried on by private enterprise, competition of government with private business, the vast possibilities of extending government bureaucracy with political manipulation of railroads and their employees under government ownership, the highly unsatisfactory experience with government ownership and operation of railroads during the World War, the dangers of dilatory and inefficient transportation service on railroads when operated by distant bureaucrats in Washington instead of by private management familiar with local needs, danger of political favoritism in service and rates, the enormous increase in the public debt which would be required by the government acquisition of the railroads, and the tremendous loss in railroad tax money to the state, county and municipal governments now paid to them upon privately-owned railroad property.

The taking of this extensive poll by the Transportation Conference followed action taken last year when it presented a resolution in Washington in opposition to the government ownership bills introduced in the 74th Congress by Senator Wheeler and Representatives Maverick and Lundeen, and was informed that the declaration could not be accepted to represent more than the sentiment of the delegates authorized to sit in the Conference, and that no broad, authoritative public sentiment ever had been expressed. The poll is an effort to ascertain the preference of the leading business organizations throughout country.

I. C. C. To Hear Pick-Up and Delivery Arguments October 1

Oral argument on the pick-up and delivery tariffs of the eastern railroads which were suspended by the Interstate Commerce Commission will be heard by the full commission at Washington on October 1.

Signal Foremen Classified As "Employees"

At the request of the Brotherhood of Railroad Signalmen the Interstate Commerce Commission has issued a report and order interpreting the work defined as that of an employee or subordinate official as including the work of signal foremen on the Union Pacific, northwestern district, and as bringing them within the term "employee" as used in the railway labor act.

Change In Pacific Pool Trains Approved by I. C. C.

Division 3 of the Interstate Commerce Commission has issued a report and order approving a supplemental contract between the Northern Pacific, Great Northern, and the Union Pacific providing for operation of four pooled passenger trains daily in each direction between Seattle, Wash., and Portland, Ore., in lieu of three trains now operated under a plan for division of the earnings previously approved by the commission.

500 Fans Take a Back Country Ride on P. R. R.

Sunday tour for Philadelphians visits sections not served by passenger trains

Touring southeastern Pennsylvania over rail lines seldom seen by the public afforded many novel and interesting experiences to 509 passengers who, on Sunday, August 23, took advantage of the second "off the beaten track" special excursion operated by the Pennsylvania this summer.

This trip, like the first of its kind, conducted on July 12, was sponsored by the railroad in co-operation with the Philadelphia Branch of the Railway Historical Society. The excursion's route covered 270 miles of the railroad, through historically interesting and scenically beautiful country. Almost half of the run was made over lines on which there is no regular passenger service at all, and much of the territory covered is not readily accessible even by motor car.

Leaving Broad Street Station, Philadelphia, at 8.30 a.m., daylight saving time, last Sunday's "off the beaten track" special first moved westward over the Pennsylvania's main line suburban section. At Downingtown, 33 miles west of Philadelphia, a 40-mile detour was made over the New Holland Branch which meanders along the Brandywine Creek and then over

"Off the Beaten Track" in Pennsylvania

the Welsh Mountains, the most southeasterly high elevation of land in Pennsylvania. From this rugged area splendid panoramic views were afforded of the fertile tobacco and grain fields and rich cattle pastures of Lancaster county.

Rejoining the main line at Lancaster, the special proceeded to Harrisburg, where the passengers paid a short visit to the State Capitol building. The train then crossed the Susquehanna river to the west bank on the famous Rockville bridge, a few miles above Harrisburg, an all-stone structure with forty-eight 70-foot arches carrying the four tracks of the main line over the river.

Proceeding down the Susquehanna, the train entered the Enola freight yard, the great eastern classification facility over the Susquehanna opposite Harrisburg. A stop was made in the yard to observe the assembling, by gravity, of solid trains of freight from the West, destined to the metropolitan cities of the eastern seaboard. The members of the party also took many photographs of freight and passenger locomotives of various classes which had been assembled at this point to give the excursionists a comprehensive idea of the different kinds of engines used by the railroad.

Leaving Enola, the train then ran nearly 100 miles southward along the Susquehanna, through the beautiful and rarely seen reaches of the river as far as Perryville, Md., the junction point with the Pennsylvania's southern division. On the way, opportunity was afforded to view the great Susquehanna power dams, including those at Safe Harbor and Holtwood, Pa., and Conowingo, Md. At Conowingo a stop of 30 minutes was made to observe and photograph the huge electric power plant at that point.

At Perryville the special was turned and retraced a portion of its route as far as Octoraro, Md., where it was switched onto the Octoraro branch for the return run to Philadelphia. Over this part of the trip the train first traversed for many miles a highly developed farming and dairying section of Maryland and Pennsylvania, passing through numerous historic pre-Revolutionary towns, including Colora and Rising Sun, Md., and Oxford, West Grove, Toughkenamon, Kennett, Chadd's Ford and Concordville, Pa. Near Chadd's Ford, the route of the train skirted portions of the battlefield of the Brandywine, including Washington's headquarters, an ancient stone farmhouse on the Philadelphia and Baltimore turnpike a few hundred yards north of the railroad. Eastward from Media, Pa., the train traversed electrified trackage through a well-known section of Philadelphia's suburbs, including Moylan-Rose Valley, Wallingford, Swarthmore and Morton.

The entire trip required 13 hours, portions of it being purposely made at slow speed to view historic and engineering features of interest. Numerous stops were also made for inspection and photographic purposes. The train included a dining car in which 294 full meals were served in addition to numerous lunches served in the coaches.

The first "off the beaten track" special, on July 12, covered a somewhat different route, including the low grade freight line and portions of the Trenton cutoff lying between Whitemarsh, Pa., and Columbia, Pa. More than 200 passengers took the initial trip.

Passenger Officers to Meet in New Orleans

The American Association of Passenger Traffic Officers will hold its annual meeting at New Orleans on November 12 and 13.

Westchester Line Not Exempt From Labor Act

Division 3 of the Interstate Commerce Commission has issued a report finding the New York, Westchester & Boston to be an integral part of the system of the New York, New Haven & Hartford and therefore not within the terms of the exemption proviso in section 1 of the railway labor act.

The Hudson & Manhattan, as to which a similar finding was made, has petitioned for a reargument before the full commission, contending that Division 3 erred in failing to find it to be an interurban electric railway.

Treiber to Represent Freight Container Bureau

Paul S. Treiber, Seattle, Wash., has been appointed to represent the perishable division of the Freight Container Bureau, Association of American Railroads, in the Pacific Northwest. Portland, Oregon, has tentatively been selected as Mr. Treiber's headquarters. The territory coming under his jurisdiction includes the states of Washington, Oregon, Idaho, Montana and Wyoming. Mr. Treiber, who is 48 years of age, has been in railroad service for 31 years, all of which have been spent in the Pacific Northwest, except for a period of 19 months during the World War when he was assigned to the American Railway Association headquarters in Washington, D. C. His recent appointment became effective on August 16.

I. C. C. To Investigate Qualifications of Motor Carrier Employees

Under the provisions of Section 204 (a) (1 and 2) of the motor carrier act, Division 5 of the commission on August 21 instituted an investigation into the matter of qualifications of employees of common carriers and contract carriers by motor vehicle subject to the act, and into the general subject of safety of operation and equipment, as more specifically described in the order, and has assigned the investigation for hearing before Division 5 on September 16 at Washington.

This investigation constitutes the first formal action of the commission itself in respect to this subject matter, but the Bureau of Motor Carriers recently issued for constructive criticisms and suggestions a set of proposed regulations which may be of assistance to all parties in preparing their testimony. It is not intended, however, to restrict interested parties to testimony bearing only on these proposed regulations of the Bureau of Motor Carriers; all pertinent testimony on the subject matter of the investigation will be received and considered.

This followed an earlier announcement that Division 5 had ordered an investigation covering both common and contract carriers of passengers and freight with a view to the establishment of reasonable requirements with respect to the maximum hours of service of employees. At the same time the commission ordered a similar proceeding for the purpose of determining whether there is need for the prescription of qualifications and maximum hours of service and standards of equipment in connection with the operation of motor vehicles by private carriers.

Steam Railway Accident Statistics

The Interstate Commerce Commission's completed statistics of steam railway accidents for the month of May, 1936, now in preparation for the printer, will show:

Item	Month of May 1936	Month of May 1935	5 months ended with May 1936	5 months ended with May 1935
Number of train accidents	555	461	3,660	2,732
Number of casualties in train, train-service and nontrain accidents:				
Trespassers:				
Killed	234	227	927	916
Injured	289	277	996	1,115
Passengers on trains:				
(a) In train accidents*				
Killed	1	..	5	..
Injured	37	1	217	240
(b) In train-service accidents				
Killed	1	2	1	8
Injured	145	102	664	580
Travelers not on trains:				
Killed	..	2	7	4
Injured	70	50	337	277
Employees on duty:				
Killed	30	42	267	233
Injured	1,633	1,259	8,722	6,487
All other nontrespassers:**				
Killed	147	115	702	659
Injured	428	423	2,754	2,517
Total—All classes of persons:				
Killed	413	388	1,909	1,820
Injured	2,602	2,112	13,690	11,216

* Train accidents are distinguished from train-service accidents by the fact that the former cause damage of more than $150 to railway property.

** Casualties to "Other nontrespassers" happen chiefly at highway grade crossings. Total highway grade-crossing casualties *for all classes of persons, including both trespassers and nontrespassers,* were as follows:

Number of accidents	247	276	1,674	1,583
Persons:				
Killed	119	108	642	630
Injured	285	297	2,002	1,884

Keeshin Operating Company

The Keeshin Transcontinental Freight Lines, Inc., and the Dickens Motor Freight, Inc., have requested the Interstate Commerce Commission to dismiss their application for authorization of the acquisition of the Dickens company by the Keeshin company, which was filed as the first step in a plan to bring all Keeshin system highway operations under a single corporation, the Keeshin Transcontinental Freight Lines, Inc. Upon further consideration it is stated, it has been determined, upon approval by the commission, to make the Keeshin Motor Express Company, Inc., an Illinois corporation, the operator of all Keeshin highway operations under lease agreements and an application for authority to make such a plan effective has been filed. The charter

Continued on next left-hand page

of the transcontinental company has been amended so as to limit its business, in so far as motor carriage is concerned, to that of a holding company.

A. S. M. E. Niagara Falls Meeting

The Niagara Falls meeting of the American Society of Mechanical Engineers, September 16-19, will combine the usual pleasure of visiting Niagara Falls, a special inspection trip, on Wednesday, September 16, to the General Electric Company plant at Schenectady, N. Y., and a two-day technical program at the Falls.

The technical program will begin on Thursday morning, September 17, at the Hotel Niagara, with one session on Power and one on Transportation. At the latter session J. C. Thirwall, General Electric Company, will present a paper on Performance of Diesel-Electric Locomotives in the Buffalo Area, and N. C. L. Brown, General Railway Signal Company, a paper on The Mechanics of the Car Retarder. Thursday afternoon there will be three sessions covering Power, Materials Handling in Process Industries and Engine Design. On Friday morning, September 18, there will be a special talk on Interconnection of Power in the Niagara District, to be followed by an inspection trip to the Huntley Station plant. Friday afternoon there will be two technical sessions, one on Hydraulics and one on the Process Industries. A session of the Wood Industries Division will be held Friday evening.

Besides the Huntley plant inspection several other special trips are being planned, including trips to woodworking plants and aircraft factories.

Additional Rate Reductions on Drought Feeds

The Department of Agriculture Drought Committee announced on August 20 that certain western and middle western railroads have published tariffs authorizing a one-third reduction of freight rates on coarse grains, such as corn, oats and barley, soybean and linseed meal and cake, hulls, and other less common feeds and feed mixtures shipped into the drought areas of North Dakota, South Dakota, and Montana.

The reduction became effective on August 21 for an experimental period of 60 days. Authority to offer the new rates has been granted by the Interstate Commerce Commission.

The new rates of 66⅔ per cent of the regular commercial tariff rates for these feeds are for single hauls and certain joint hauls. They do not apply to cottonseed meal and cake, since these products originate in territories other than that served by the carriers which have granted the reduction on concentrates.

"While these rate reductions that have been granted on concentrates will be very helpful," Jesse W. Tapp, chairman of the Drought Committee, pointed out, "they are not as extensive as was requested by the Drought Committee."

The committee also announced that carriers serving parts of Washington, Oregon, Idaho, California and other western states had granted additional rate reductions on joint hauls of hay and roughage into the Dakotas and Montana.

It was further announced that, effective August 19, three carriers serving drought areas in eastern Montana—the Chicago, Milwaukee, St. Paul & Pacific, the Great Northern, and the Northern Pacific—in co-operation with the Union Pacific Railroad, had authorized the reduced livestock rates of 85 per cent on outgoing shipments and 15 per cent on return shipments made on the Union Pacific from those areas to points in Montana and Idaho.

Commissioner Aitchison of the Interstate Commerce Commission has issued almost daily amendments to his drought-relief orders authorizing extensions of the reduced rates into additional territory.

Motor Carriers Bureau Issues Rulings

The Bureau of Motor Carriers of the Interstate Commerce Commission has begun issuing a series of administrative rulings, made in response to questions propounded by the public, indicating what is deemed by the bureau to be the correct application and interpretation of the motor carrier act. Rulings of this kind are tentative and provisional and are made in the absence of authoritative decisions upon the subject by the commission.

Some of the rulings are of especial interest to the railroads because they indicate whether certain commodities are considered to be agricultural commodities. Under the law the commission's regulations, except those concerning safety of operation, hours of service of employees, and standards of equipment, do not apply to motor vehicles used exclusively in carrying livestock, fish (including shell fish), or agricultural commodities (not including manufactured products thereof). One of the rulings is that fresh fruits are agricultural commodities within the meaning of Section 203 of the act. Another is that ginned cotton is not a manufactured product of an agricultural commodity, while another is that canned fruits and canned vegetables are manufactured products of agricultural commodities and are therefore not exempt commodities.

It has come to the attention of the commission that since the service of the examiners' recommended reports and orders in Dockets Nos. BMC C-1, C-2, C-3 and C-4, which are the four investigations on the commission's own motion, under Section 203 (b) (8) of the motor carrier act, into the matter of the conditional exemption of transportation by motor vehicle in the municipalities of St. Louis, Mo., New York, N. Y., Chicago, Ill., and Los Angeles, Calif., in contiguous municipalities, and in the zones "adjacent to and commercially a part of any such municipality or municipalities," certain motor carriers have proceeded on the assumption that their operations within the areas in question are now exempted from all regulation under the motor carrier act, except the general safety provisions of Section 204, and have either canceled their tariffs and schedules or have disregarded them in collecting their charges.

The Bureau of Motor Carriers has issued a notice pointing out that the examiners' recommended reports and orders in these investigations embody only the views of the examiners; they have not been considered by the commission, and they are therefore not authoritative or in any way binding on the commission. Motor carriers operating in these areas who mistakenly accept these recommended reports and orders as authority for any operation whatsoever or for collecting charges which differ from those provided in their tariffs or schedules are doing so at their own peril and are quite possibly subjecting themselves to the penalties provided in Section 222 of the motor carrier act.

Supply Trade

The Harnischfeger Corporation, Milwaukee, Wis., has appointed the **Arthur Wagner Company**, Chicago, distributor for northern Illinois territory.

A. R. Ellis, vice-president and director of the **Pittsburgh Testing Laboratory**, Pittsburgh, Pa., has been elected president, retaining also his directorship.

Herbert George, sales engineer for the **Wood Conversion Company**, St. Paul, Minn., has been appointed manager of the Refrigeration Sales division, with headquarters at 360 North Michigan avenue, Chicago. Mr. George became active in the refrigeration and insulation industry in 1925, resigning as senior insulation engineer in charge of the laboratory of the Frigidaire Corporation at New Orleans, in 1930, to enter the employ of the Wood Conversion Company. Since that time he has supervised and directed the development of products and machinery for the processing of balsam-wood fibre slabs in cabinet builders' plants for the Wood Conversion Company.

Peter M. Lorenz has been appointed district sales manager and **Frederick A. Ernst** has been appointed assistant manager of the St. Louis office of the **Inland Steel Company**, Chicago. Mr. Lorenz entered the employ of the Inland Steel Company in 1910. During the war he served in the Ordnance department, being stationed at Buffalo, N. Y., as chief army inspector of ordnance, in charge of inspection at various eastern steel plants. From 1919 to 1921, he was in charge of the Detroit office of the Inland Steel Company, and since the latter date has been associated with the Chicago sales force.

Mr. Ernst first entered the steel industry in 1914 with the Trumbull Steel Company, Warren, Ohio, and later was transferred to its Chicago office. In 1922 he became associated with the Falcon Steel Company and later the Granite City Steel Company and the Columbia Steel Company. In 1928 he entered the employ of the Inland Steel Company at St. Louis.

OBITUARY

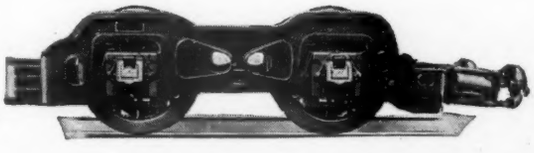
O. H. Mellum, assistant vice-president of the American Car & Foundry Company, with headquarters at Chicago, who was killed in Lake Bluff, Ill., on August 14, by a freight train while alighting from

Continued on next left-hand page

A rough start . . . splash! The coffee is in a passenger's lap.

This needn't happen! Booster locomotives start their trains smoothly, unnoticed except for the moving landscape.

Train travel is luxurious, fast and safe. The Booster, by smooth starting, makes it the ultimate in comfort and desirability.



FRANKLIN RAILWAY SUPPLY CO., INC.

NEW YORK
CHICAGO
MONTREAL

another train at that station, as was reported in the *Railway Age* of August 22, was born in 1890. He entered the employ of the American Car & Foundry Com-

(c) Moffett Studio
O. H. Mellum

pany in 1904 as an office boy and messenger. After serving in various capacities, Mr. Mellum was appointed sales agent at Chicago, and in February, 1930, was promoted to assistant vice-president, which position he was holding at the time of his death.

Equipment and Supplies

LOCOMOTIVES

THE RIO GRANDE DO SUL (Brazil) contemplates buying 10 articulated locomotives. See item under Freight Cars.

THE DETROIT & TOLEDO SHORE LINE is inquiring for three locomotives of the 2-8-2 type.

FREIGHT CARS

THE RIO GRANDE DO SUL (Brazil) contemplates buying 100 stock cars and 300 box cars of 28 tons' capacity. Jose Simeao Soerio de Souza is purchasing agent, at Porto Alegre, Rio Grande do Sul, Brazil.

PASSENGER CARS

THE CHICAGO & NORTH WESTERN is inquiring for two seven-car, light weight alloy steel passenger trains. The inquiry is issued to ascertain comparative costs rather than with a view to immediate purchase. Each train includes one combination parlor-bar-lounge car, 2 first class coaches, 1 dining car, 1 lounge-parlor car, 1 parlor car and 1 parlor-drawing room-observation car.

IRON & STEEL

THE LEHIGH & NEW ENGLAND has placed an order with the Carnegie-Illinois Steel Corporation for 800 tons of 130-lb. A.R.E.A. type B, head free-control cooled rail.

Financial

ASHLEY, DREW & NORTHERN.—*R. F. C. Loan.*—The Interstate Commerce Commission has authorized extension for three years of a loan of $50,000 by the Reconstruction Finance Corporation to this company.

CANTON & CARTHAGE.—*Abandonment.*—The Interstate Commerce Commission has authorized this company to abandon operation under trackage rights over a part of a line owned by the Pearl River Valley Lumber Company between Pelahatchie, Miss., and Sand Hill, 13.8 miles.

CENTRAL OF NEW JERSEY.—*Acquisition.*—This company has applied to the Interstate Commerce Commission for authority to acquire control of the Ogden Mine Railroad by purchase of its capital stock. It now operates the line under lease.

CHICAGO & NORTH WESTERN.—*Reorganization.*—The Interstate Commerce Commission has authorized a group of officers of life insurance companies which have large holdings of the securities of this company to intervene in the reorganization case now before the Commission.

CHICAGO, ROCK ISLAND & PACIFIC.—*Abandonment.*—The Interstate Commerce Commission has authorized this company and its trustees to abandon a branch line extending from Newton, Iowa, to Reasnor, 9.6 miles.

CHICAGO UNION STATION.—*Bonds.*—Division 4 of the Interstate Commerce Commission has authorized this company to issue $7,000,000 of 3½ per cent guaranteed bonds, to be sold at 100½ and interest, the proceeds, together with treasury funds, to be used to redeem outstanding bonds.

CINCINNATI & WESTWOOD.—*Foreclosure.*—Louis Nippert, trustee for the bondholders on August 21 asked the Common Pleas court at Cincinnati, Ohio, to foreclose a mortgage executed 45 years ago. As trustee, he asks that he succeed to all rights of the road, that the company be ejected and that real estate be sold to satisfy claims of the bondholders. Owing to the advent of the street car and the building of a main line track by another railroad, the Cincinnati & Westwod abandoned its passenger service in 1896, while no freight has been hauled since June 1, 1924. To comply with the terms of the franchise, periodic trips are made by a rail motor car.

DALLES & SOUTHERN. — *Foreclosure Dropped.*—Wasco county, Oregon, has accepted $35,134 as payment in full of delinquent tax claims against the Dalles & Southern, and foreclosure proceedings against the railroad, now on appeal before the state supreme court, have been dropped. The Wasco county court, in announcing acceptance of the compromise offer, revealed it was the intention of the company to scrap the rolling stock and tear up the rails for sale as junk. The settlement is in satisfaction of a claim held by the county of approximately $44,000 for delinquent taxes, exclusive of penalty and interest. For a number of years the county court has sought to prevent scrapping of the railroad, which penetrates a large stand of timber in the Friend district, by endeavoring to interest large lumber interests, which could use the road as a logging line. Decision to permit scrapping of the railroad was reached only after all efforts along this line had failed.

MISSOURI PACIFIC. — *Terminal Shares Case.*—The Missouri Pacific on August 21 filed a motion in the Federal District court at St. Louis, asking that it set aside its order of July 22 barring Terminal Shares, Inc., a Van Sweringen corporation, from asserting a $19,000,000 claim against the railroad in connection with the sale in 1930 of terminal facilities in Kansas City and St. Joseph, Mo. The motion contended the Interstate Commerce Commission had "the power and duty to determine whether the contract (for the sale) was for the best interests of the public and the debtor corporation."

MONESSEN SOUTHWESTERN. — *Certificate Denied.*—The Interstate Commerce Commission has denied the application of this company for a certificate of convenience and necessity authorizing it to operate a line extending from a connection with the P. McK. & Y. in Monessen, Pa., and Pittsburgh & West Virginia at Monessen Junction, a total of 6.5 miles. The applicant is controlled by a steel company.

NEW YORK, NEW HAVEN & HARTFORD.—*Equipment Trust Certificates.*—The Federal court at New Haven has signed an order authorizing the trustees of this company to issue $3,075,000 of 3 per cent equipment trust certificates, which will mature in installments over a 15-year period.

NORTHERN PACIFIC. — *Equipment Trust Certificates.*—Salomon Bros. & Hutzler, R. W. Pressprich & Co., and Estabrook & Co. have offered $3,000,000 of 2¼ per cent serial equipment trust certificates of this company maturing in installments 1937-46, priced to yield from 0.5 per cent to 2.3 per cent, depending upon maturity date.

PENNSYLVANIA.—*Bonds.*—Division 4 of the Interstate Commerce Commission has authorized the sale of $20,000,000 of general mortgage bonds at 99½ and interest, the proceeds to be applied to restoration of working capital.

SOUTHERN.—*Abandonment.* — This company has applied to the Interstate Commerce Commission for authority to abandon its branch line from Vasper to Lafollette, Tenn., 10.3 miles, part of which is in territory flooded in connection with the construction of the Norris dam by the Tennessee Valley Authority. The T. V. A. was proceeding to take the property without condemnation and had asked the commission to require the railroad to apply for an abandonment certificate but the Southern in its application says a settlement has now been made with the T. V. A.

WESTERN PACIFIC. — *Reorganization Hearing Postponed.*—The Interstate Com-

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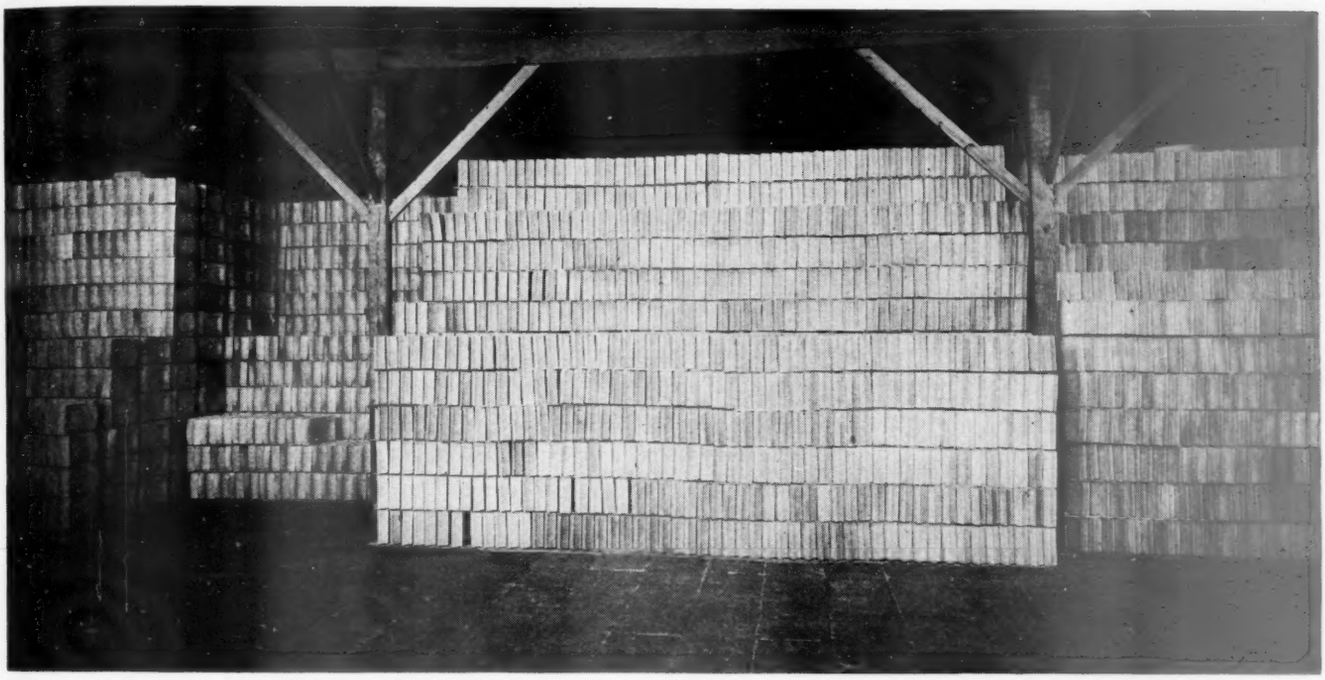
NO. 5 OF A SERIES ON THE MANUFACTURE OF SECURITY ARCH BRICK

and finally . . .
THE SERVICE OF SUPPLY



Large stock sheds as shown above are located at many convenient points throughout the country.

Arch Brick supply is one of the most important items for economical locomotive operation.

The American Arch Company, in maintaining an adequate stock of Security Arch Brick at many convenient points, recognizes its responsibility to the railroads.

Stock sheds carrying ample stocks ready for immediate shipment safeguard against delay.

This facilitates locomotive arch maintenance and aids in maintaining maximum fuel economy.

There's more to Security Arches than just brick

HARBISON-WALKER REFRACTORIES CO.

Refractory Specialists

AMERICAN ARCH CO.
INCORPORATED

Locomotive Combustion Specialists » » »

merce Commission has postponed from August 25 to September 28 the hearing before Examiner Boyden on the reorganization plan.

Dividends Declared

Chestnut Hill.—75c, quarterly, payable September 4 to holders of record August 20.

Union Pacific.—Preferred, $2.00, semi-annually; Common, $1.50, both payable October 1 to holders of record September 1.

Average Prices of Stocks and of Bonds

	Aug. 25	Last week	Last year
Average price of 20 representative railway stocks..	53.28	54.36	35.52
Average price of 20 representative railway bonds..	81.20	81.44	74.11

Railway Officers

FINANCIAL, LEGAL AND ACCOUNTING

T. J. Tobin has been elected auditor for the lessees of the Buffalo Creek railroad, with headquarters at Cleveland, Ohio, succeeding **J. K. Thompson,** resigned, effective September 1.

OPERATING

T. A. Blair, division engineer of the Slaton division of the Panhandle & Santa Fe, has been promoted to trainmaster on the same division, with headquarters as before at Slaton, Tex.

H. B. Stewart, Jr., purchasing agent of the Akron, Canton & Youngstown, has been promoted to the newly-created position of general manager, with headquarters as before at Akron, Ohio. Mr. Stewart's appointment became effective on July 15.

M. H. Gold, superintendent of the Georgia division of the Seaboard Air Line, with headquarters at Atlanta, Ga., has been appointed superintendent of the South Florida division, with headquarters at Tampa, Fla., succeeding **W. H. Blake,** who has retired from active duty after 30 years of service with this road and affiliated companies. **J. H. Bowen** has been appointed superintendent of the Georgia division, with headquarters at Atlanta, Ga., succeeding Mr. Gold.

TRAFFIC

H. A. Peterson, commercial agent for the Northern Pacific at Chicago, has been promoted to general agent with headquarters at Cincinnati, Ohio, to succeed **W. F. Goodknight,** who has been transferred to Kansas City, Mo., to replace **F. A. Acker,** who has retired.

G. G. Early, freight traffic manager of the Wabash, has been promoted to chief traffic officer, with headquarters as before at St. Louis, Mo., succeeding **William C. Maxwell,** whose death on August 5 was reported in the *Railway Age* of August 15. Mr. Early's appointment will become effective on September 1.

R. K. Horton, division freight agent of the New York Central System, with headquarters at Rochester, N. Y., has been appointed coal freight agent at New York. **M. J. Murphy** has been appointed assistant coal freight agent, with headquarters at New York. **Irving Savage** has been appointed general agent, coal traffic department, at New York.

Walter A. Hein, district freight agent for the Northern Pacific, with headquarters at Fargo, N. D., has been promoted to general perishable freight agent with headquarters at St. Paul, Minn., to succeed **G. R. Merritt,** who has retired, effective August 1, after nearly 50 years as a traffic representative of the Northern Pacific. Mr. Hein's appointment became effective on August 24.

O. L. Thompson, traveling freight agent on the Chicago & North Western at New Orleans, La., has been promoted to general agent with the same headquarters, to succeed **L. A. Uvaas,** who has been transferred to Cincinnati, Ohio, to succeed **G. L. Helmstadter.** As noted in the *Railway Age* of August 8 Mr. Helmstadter has been appointed general passenger agent at Chicago.

ENGINEERING AND SIGNALING

M. F. Temple, principal assistant engineer of the Gulf, Colorado & Santa Fe, with headquarters at Galveston, Tex., retired from active service on August 1.

Mason Rector, an assistant engineer on the Chicago, Rock Island & Pacific, has been appointed temporary division engineer on the Oklahoma division, with headquarters at El Reno, Okla., succeeding **C. A. Richards,** who has been granted a leave of absence.

J. B. Raymond, roadmaster on the Panhandle & Santa Fe, with headquarters at Amarillo, Tex., has been promoted to division engineer with headquarters at Slaton, Tex., to succeed **T. A. Blair,** whose appointment as trainmaster is noted elsewhere in these columns.

MECHANICAL

F. L. Crissey, general shop foreman for the Denver & Rio Grande Western, with headquarters at Salt Lake City, Utah, has been appointed assistant mechanical superintendent at Denver, Col.

SPECIAL

Dr. E. Howard Hanna has been appointed assistant medical director of the New York Central system (except the Boston & Albany), with headquarters in the Michigan Central station, Detroit, Mich.

OBITUARY

John Gill, who retired in 1910 as superintendent of motive power of the Chicago, Indianapolis & Louisville, died at his home at Chicago on August 25.

Moses Burpee, consulting engineer of the Bangor & Aroostook, and formerly chief engineer of this company, died at his home at Houlton, Me., on August 18, at the age of 89 years.

Net Income for June and Six Months of Calendar Year 1936

		Net Income 1936	Net Income 1935
Akron, Canton & Youngstown	June	$6,192	$10,766
	6 mos.	103,119	105,035
Alton	June	—155,399	—368,478
	6 mos.	—904,867	—1,389,423
Atchison, Topeka & Santa Fe System	June	2,289,533	2,321,949
	6 mos.	—526,422	1,424,398
Atlanta & West Point	June	—4,897	—17,506
	6 mos.	—13,027	—46,415
Western of Alabama	June	1,820	—20,757
	6 mos.	—11,638	—76,346
Atlanta, Birmingham & Coast	June	—33,064	—23,786
	6 mos.	—56,006	—103,231
Atlantic Coast Line	June	—527,630	—646,032
	6 mos.	300,678	—450,409
Charleston & Western Carolina	June	—410	—8,364
	6 mos.	72,678	51,417
Baltimore & Ohio	June	201,393	73,986
	6 mos.	—1,981,278	—2,496,158
Staten Island Rapid Transit	June	.....	.....
	6 mos.	.....	.....
Bangor & Aroostook	June	—58,053	8,837
	6 mos.	544,327	961,944
Bessemer & Lake Erie	June	677,891	283,444
	6 mos.	1,138,177	370,139
Boston & Maine	June	—58,637	50,263
	6 mos.	—2,757,437	—283,145
Burlington-Rock Island	June	—91,269	—108,556
	6 mos.	—534,140	—543,213
Cambria & Indiana	June	63,531	57,168
	6 mos.	323,062	424,809
Canadian Pacific Lines in Maine	June	.....	.....
	6 mos.	.....	.....
Canadian Pacific Lines in Vermont	June	.....	.....
	6 mos.	.....	.....
Central of Georgia	June	—247,385	—278,780
	6 mos.	—1,350,408	—1,479,985
Central of New Jersey	June	—324,184	45,773
	6 mos.	—1,701,530	—516,746
Central Vermont	June	—106,650	—19,751
	6 mos.	—688,552	—417,506
Chesapeake & Ohio	June	2,886,837	3,273,008
	6 mos.	17,903,747	13,487,586
Chicago & Eastern Illinois	June	—130,235	—190,083
	6 mos.	—654,193	—854,658
Chicago & Illinois Midland	June	28,770	8,465
	6 mos.	146,220	118,073
Chicago & North Western	June	—927,864	—1,410,923
	6 mos.	—9,092,676	—6,814,307
Chicago, Burlington & Quincy	June	—442,379	—1,456,542
	6 mos.	—942,194	—3,542,392
Chicago Great Western	June	44,629	—142,271
	6 mos.	—651,059	—962,333

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Net Income for June and Six Months of Calendar Year 1936—(Continued)

		Net Income 1936	Net Income 1935
Chicago, Indianapolis & Louisville	June	—130,980	—121,939
	6 mos.	—672,021	—819,979
Chicago, Mil., St. Paul & Pacific	June	—1,446,568	—2,844,769
	6 mos.	—9,226,946	—10,309,417
Chicago Rock Island & Pacific	June	—1,173,542	—1,745,157
	6 mos.	—8,908,308	—8,697,785
Chicago Rock Island & Gulf	June	—186,449	—220,011
	6 mos.	—559,605	—740,010
Chicago, St. Paul, Minn. & Omaha	June	15,753	—340,380
	6 mos.	—1,458,671	—1,575,359
Clinchfield Railroad	June	—66,256	—95,164
	6 mos.	—59,534	—363,919
Colorado & Southern	June	—164,692	—109,302
	6 mos.	141,383	—1,114,937
Ft. Worth & Denver City	June	—46,722	—103,996
	6 mos.	—286,982	—603,383
Columbus & Greenville	June	8,202	—4,926
	6 mos.	10,773	—29,852
Delaware & Hudson	June	—121,854	—96,763
	6 mos.	—890,793	—1,050,626
Delaware, Lackawanna & Western	June	—93,256	—250,109
	6 mos.	—503,863	—883,620
Denver & Rio Grande Western	June	—711,832	—600,565
	6 mos.	—2,891,424	—2,583,611
Denver & Salt Lake	June	—50,607	43,195
	6 mos.	141,807	230,096
Detroit & Mackinac	June	—2,524	—10,990
	6 mos.	—58,317	—71,098
Detroit & Toledo Shore Line	June	39,559	47,374
	6 mos.	555,844	490,214
Detroit, Toledo & Ironton	June	102,781	103,106
	6 mos.	1,124,936	1,528,665
Duluth, Missabe & Northern	June	1,468,048	1,015,163
	6 mos.	402,629	147,422
Duluth, Winnipeg & Pacific	June	—56,986	—70,686
	6 mos.	—262,886	—305,869
Elgin, Joliet & Eastern	June	159,451	68,687
	6 mos.	770,480	900,105
Erie	June	186,824	75,906
	6 mos.	158,653	—668,000
New Jersey & New York	June	—28,690	—32,815
	6 mos.	—177,296	—243,145
New York, Susquehanna & Western	June	—59,379	623
	6 mos.	—155,127	—152,629
Florida East Coast	June	—388,051	—505,652
	6 mos.	—479,418	—957,432
Fort Smith & Western	June	—31,535	—36,680
	6 mos.	—154,101	—192,482
Georgia Railroad	June	971	386
	6 mos.	—50,523	—69,877
Georgia & Florida	June	—60,251	—45,836
	6 mos.	—364,553	—327,708
Grand Trunk Western	June	213,604	—48,454
	6 mos.	975,269	—197,715
Canadian Nat'l Lines in New Eng.	June	—143,047	—141,932
	6 mos.	—737,804	—738,729
Great Northern	June	643,076	611,810
	6 mos,	—2,869,036	—3,298,244
Green Bay & Western	June	17,496	—6,477
	6 mos.	68,604	69,325
Gulf & Ship Island	June	—33,044	—7,173
	6 mos.	—68,882	—84,834
Gulf, Mobile & Northern	June	50,124	22,000
	6 mos.	217,753	60,714
Illinois Central	June	—435,479	—712,962
	6 mos.	—2,022,598	—2,155,474
Yazoo & Mississippi Valley	June	13,391	252,002
	6 mos.	—320,752	—972,259
Illinois Central System	June	.....	.....
	6 mos.	.....	.....
Illinois Terminal	June	—15,462	—55,324
	6 mos.	—10,809	—224,582
Kansas City Southern	June	97,441	—96,409
	6 mos.	210,448	—774,147
Kansas, Oklahoma & Gulf	June	47,978	6,124
	6 mos.	290,914	139,583
Lake Superior & Ishpeming	June	248,200	101,066
	6 mos.	203,089	39,672
Lehigh & Hudson River	June	9,583	16,885
	6 mos.	86,328	116,352
Lehigh & New England	June	6,291	121,002
	6 mos.	197,318	327,858
Lehigh Valley	June	308,872	26,820
	6 mos.	29,682	—417,234
Louisiana & Arkansas	June	57,415	26,866
	6 mos.	287,643	113,705
Louisiana, Arkansas & Texas	June	8,987	11,412
	6 mos.	13,576	—16,000
Louisville & Nashville	June	711,897	389,486
	6 mos.	3,304,018	1,465,021
Maine Central	June	—113,656	32,356
	6 mos.	—401,994	—28,473
Midland Valley	June	48,451	41,354
	6 mos.	62,406	—14,392
Minneapolis & St. Louis	June	—87,502	—320,530
	6 mos.	—1,200,948	—1,714,219
Minneapolis, St. Paul & S. S. Marie	June	—373,641	—473,408
	6 mos.	—3,211,454	—3,480,068
Duluth, South Shore & Atlantic	June	48,919	15,951
	6 mos.	—192,990	—311,874
Spokane International	June	—11,899	—24,229
	6 mos.	—113,366	—167,830
Mississippi Central	June	2,013	—749
	6 mos.	—4,832	—53,173
Missouri-Arkansas	June	7,563	4,004
	6 mos.	49,313	25,581
Missouri-Illinois	June	5,978	—7,109
	6 mos.	—37,995	—31,673
Missouri-Kansas-Texas Lines	June	—194,118	—422,461
	6 mos.	—1,468,840	—2,704,736
Missouri Pacific	June	—978,097	—1,694,975
	6 mos.	—6,774,512	—8,775,857
Gulf Coast Lines	June	.....	.....
	6 mos.	.....	.....
International Great Northern	June	—248,986	—278,925
	6 mos.	—1,431,508	—1,124,516
Mobile & Ohio	June	—82,778	—119,544
	6 mos.	—561,744	—1,004,402
Monongahela	June	40,234	105,644
	6 mos.	454,382	250,110
Montour	June	68,120	99,421
	6 mos.	347,513	400,960
Nashville, Chattanooga & St. Louis	June	—68,823	—113,732
	6 mos.	—280,711	—476,874
Nevada Northern	June	13,532	4,092
	6 mos.	96,009	22,932
New York Central	June	1,045,726	—736,815
	6 mos.	360,864	—4,160,013
Pittsburgh & Lake Erie	June	423,054	278,055
	6 mos.	1,832,052	1,340,521
New York, Chicago & St. Louis	June	169,020	5,944
	6 mos.	1,139,037	7,465
New York, New Haven & Hartford	June	—472,581	—35,052
	6 mos.	—4,286,497	—1,613,930
New York Connecting	June	—19,977	4,765
	6 mos.	21,594	33,949
New York, Ontario & Western	June	—12,941	46,387
	6 mos.	—160,256	65
Norfolk & Western	June	2,461,273	2,179,039
	6 mos.	14,482,962	9,934,057
Norfolk Southern	June	65,070	122,565
	6 mos.	—209,115	—135,119
Northern Pacific	June	—562,347	—1,134,057
	6 mos.	—5,177,419	—6,504,463
Northwestern Pacific	June	—87,259	—104,145
	6 mos.	—756,598	—921,677
Oklahoma City-Ada-Atoka	June	11,459	48,845
	6 mos.	95,924	33,216
Pennsylvania	June	2,805,081	2,364,897
	6 mos.	11,763,894	10,126,169
Long Island	June	26,022	10,363
	6 mos.	—517,031	—880,803
Pennsylvania-Reading Seashore Lines	June	—241,987	—172,000
	6 mos.	—1,475,611	—1,625,127
Pere Marquette	June	64,778	—46,010
	6 mos.	1,166,983	337,177
Pittsburg & Shawmut	June	—48,034	12,945
	6 mos.	—241,804	11,352
Pittsburgh & West Virginia	June	23,327	1,413
	6 mos.	205,407	14,673
Pittsburg, Shawmut & Northern	June	—16,468	2,193
	6 mos.	—50,513	—32,611
Reading	June	515,202	732,975
	6 mos.	2,944,465	2,587,038
Richmond, Fredericksburg & Potomac	June	36,050	11,563
	6 mos.	178,447	220,074
Rutland	June	—3,291	—35,196
	6 mos.	—197,945	—267,928
St. Louis-San Francisco	June	—681,237	—1,248,995
	6 mos.	—4,535,093	—6,416,747
Ft. Worth & Rio Grande	June	—12,812	—16,601
	6 mos.	—142,590	—141,828
St. Louis, San Francisco & Texas	June	—42,366	—70,665
	6 mos.	—368,542	—343,879
St. Louis Southwestern Lines	June	9,211	—102,529
	6 mos.	—139,278	—299,298
Seaboard Air Line	June	—725,662	—862,182
	6 mos.	—3,372,957	—3,197,630
Southern Ry.	June	222,694	—398,803
	6 mos.	46,103	—2,545,610
Alabama Great Southern	June	250,214	124,720
	6 mos.	370,250	—33,167
Cinn., New Orleans & Texas Pacific	June	233,463	171,054
	6 mos.	1,414,042	699,352
Georgia Southern & Florida	June	—38,112	—12,875
	6 mos.	—133,635	—143,910
New Orleans & Northeastern	June	—1,064	—16,819
	6 mos.	—72,974	—139,081
Northern Alabama	June	—2,092	—490
	6 mos.	1,694	—44,654
Southern Pacific Transportation System	June	2,240,698	109,410
	6 mos.	113,912	—3,323,895
Spokane, Portland & Seattle	June	—183,201	—176,017
	6 mos.	—1,472,722	—1,298,534
Tennessee Central	June	13,638	—79
	6 mos.	42,226	25,779
Texas & Pacific	June	75,346	63,165
	6 mos.	525,752	106,606
Texas Mexican	June	—25,331	—16,299
	6 mos.	39,656	66,839
Toledo, Peoria & Western	June	13,154	—5,868
	6 mos.	127,252	10,905
Union Pacific System	June	1,966,382	1,234,735
	6 mos.	2,976,519	3,578,382
Utah	June	—26,979	—9,915
	6 mos.	—39,254	—83,187
Virginian	June	322,115	425,841
	6 mos.	2,481,045	1,796,016
Wabash	June	—444,142	—591,331
	6 mos.	—1,449,021	—1,588,022
Ann Arbor	June	—2,680	1,636
	6 mos.	—72,440	13,624
Western Maryland	June	64,405	63,028
	6 mos.	565,302	436,037
Western Pacific	June	—560,763	—265,568
	6 mos.	—2,105,579	—1,427,371
Wheeling & Lake Erie	June	331,431	202,821
	6 mos.	1,456,361	654,702
Wichita Falls & Southern	June	3,880	3,699
	6 mos.	—42,545	—46,124

Table of Freight Operating Statistics begins on next left-hand page

Freight Operating Statistics of Large Steam Railways—Selected Items for the Month of April,

Region, road, and year	Miles of road operated	Locomotive-miles: Train-miles	Locomotive-miles: Principal and helper	Locomotive-miles: Light	Car-miles: Loaded (*thousands*)	Car-miles: Per cent loaded	Ton-miles (*thousands*): Gross, excluding locomotives and tenders	Ton-miles (*thousands*): Net, revenue and non-revenue	Number of road locomotives on line: Serviceable: Not stored	Serviceable: Stored	Unserviceable	Per cent unserviceable
New England Region:												
Boston & Albany.....1936	373	135,634	140,612	9,476	3,319	67.2	176,148	60,272	50	37	5	40.2
1935	402	125,189	129,759	8,694	3,083	68.6	162,057	56,665	49	35	12	36.5
Boston & Maine.....1936	1,972	290,460	339,313	33,346	9,823	66.2	549,867	196,714	134	1	152	53.0
1935	2,008	277,232	311,619	30,254	9,323	67.9	508,742	184,529	121	..	163	57.4
N. Y., New H. & Hartf...1936	2,031	350,463	430,229	21,870	11,890	66.2	647,402	234,309	170	5	107	36.5
1935	2,045	335,239	409,233	20,249	11,144	64.6	613,678	220,917	172	21	111	36.4
Great Lakes Region:												
Delaware & Hudson.....1936	831	212,304	291,747	37,319	7,538	64.5	464,312	215,209	113	136	36	12.6
1935	835	204,168	284,336	33,851	7,070	61.1	445,644	202,112	84	157	30	11.1
Del., Lack. & Western.....1936	983	384,908	428,937	57,401	12,472	66.2	741,496	291,706	162	..	81	33.3
1935	992	344,353	385,529	49,415	10,616	63.8	656,004	256,350	128	48	81	31.5
Erie (incl. Chi. & Erie)...1936	2,298	675,338	708,813	34,389	28,447	65.9	1,686,194	634,508	199	49	227	47.8
1935	2,305	619,789	644,346	36,112	25,862	64.6	1,529,238	563,815	199	89	192	40.0
Grand Trunk Western.....1936	1,027	275,673	280,680	3,764	7,642	63.6	454,400	158,445	80	..	59	42.4
1935	1,007	243,088	245,132	1,750	6,688	60.7	399,485	129,451	75	..	69	47.9
Lehigh Valley 1936	1,318	389,065	414,451	45,315	12,966	65.5	789,153	317,560	144	..	155	51.8
1935	1,335	378,095	400,025	37,554	11,593	63.7	730,100	294,793	149	9	148	48.4
New York Central.....1936	10,789	2,732,512	2,881,480	181,021	91,167	60.0	5,837,629	2,327,218	900	112	516	33.8
1935	11,066	2,314,283	2,413,292	143,526	76,554	60.2	4,769,070	1,840,679	713	117	637	46.3
New York, Chi. & St. L...1936	1,672	469,601	473,522	6,190	16,484	63.0	976,428	363,189	148	20	26	13.4
1935	1,661	416,867	419,921	4,416	13,825	62.2	819,990	292,071	125	52	14	7.3
Pere Marquette 1936	2,081	384,288	402,143	6,869	10,175	62.0	648,343	233,741	118	3	37	23.4
1935	2,096	348,147	369,347	3,606	8,814	59.9	559,400	199,358	111	5	41	26.1
Pitts. & Lake Erie.....1936	234	75,305	77,373	....	2,786	58.6	234,608	127,455	29	10	28	41.8
1935	234	54,900	57,506	15	1,937	54.6	160,931	83,108	21	8	42	59.1
Wabash 1936	2,435	578,954	586,766	12,042	17,623	63.4	1,031,389	344,689	137	27	146	47.1
1935	2,435	554,604	562,001	11,436	16,842	60.7	987,645	310,040	130	28	175	52.6
Central Eastern Region:												
Baltimore & Ohio.....1936	6,366	1,411,080	1,732,245	173,858	43,409	64.7	2,863,902	1,294,896	638	41	623	47.8
1935	6,321	1,240,508	1,478,532	152,368	35,290	60.6	2,327,556	975,466	567	137	608	46.3
Central of New Jersey.....1936	681	151,055	170,883	30,393	5,136	62.5	346,383	166,587	59	10	86	55.5
1935	684	137,409	154,388	28,223	4,706	58.8	327,258	154,949	58	17	82	52.2
Chicago & Eastern Ill.....1936	931	171,918	172,394	2,893	4,192	66.7	253,652	106,217	54	2	52	48.1
1935	939	149,713	150,928	2,454	3,469	60.0	222,473	86,613	42	7	59	54.6
Elgin, Joliet & Eastern....1936	434	95,037	96,391	1,614	2,518	63.2	189,591	94,713	56	..	30	34.9
1935	446	87,029	88,027	1,181	2,000	58.7	154,642	74,671	53	4	29	33.7
Long Island 1936	393	27,815	28,469	16,549	285	50.7	21,999	8,240	29	4	18	35.3
1935	393	32,524	33,539	14,851	329	53.3	25,301	10,448	32	..	21	39.6
Pennsylvania System 1936	9,801	2,907,321	3,331,098	374,112	100,909	62.1	6,812,949	2,985,476	1,321	162	884	37.3
1935	10,009	2,467,063	2,728,852	276,244	83,613	61.4	5,476,192	2,296,352	1,214	254	958	39.5
Reading 1936	1,449	413,350	454,568	54,574	11,874	62.6	841,221	402,078	191	63	90	26.2
1935	1,452	372,113	407,643	47,067	10,426	59.1	743,526	346,084	184	88	97	26.3
Pocahontas Region:												
Chesapeake & Ohio.....1936	3,050	777,802	817,921	35,376	34,897	58.6	2,851,418	1,557,643	394	53	82	15.5
1935	3,057	718,929	751,518	27,700	28,950	54.2	2,431,886	1,260,168	347	123	96	17.0
Norfolk & Western.....1936	2,145	609,114	645,611	31,104	25,092	61.3	2,020,078	1,082,921	266	55	53	14.2
1935	2,146	528,160	551,005	23,072	19,824	58.8	1,560,488	778,800	216	126	36	9.5
Southern Region:												
Atlantic Coast Line.....1936	5,101	615,940	618,181	8,414	13,132	60.4	726,893	241,921	231	37	143	34.8
1935	5,148	603,279	606,588	8,430	12,588	58.8	690,706	221,871	267	42	129	29.5
Central of Georgia.....1936	1,886	243,018	245,698	4,161	5,251	72.3	285,254	110,264	99	..	26	20.8
1935	1,886	226,332	227,902	3,426	4,972	68.3	272,982	103,118	102	..	40	28.2
Illinois Central (incl. 1936	6,566	1,488,880	1,496,730	27,643	35,360	65.0	2,189,480	886,339	635	18	216	24.9
Y. & M. V.).....1935	6,587	1,348,551	1,355,734	26,663	31,318	61.0	1,974,170	764,156	604	6	318	34.3
Louisville & Nashville.....1936	4,998	1,042,952	1,134,859	28,337	24,485	60.7	1,708,768	804,353	328	8	229	40.5
1935	5,046	912,484	983,463	24,204	19,299	57.2	1,347,444	600,646	304	15	262	45.1
Seaboard Air Line.....1936	4,295	514,054	531,462	3,888	12,837	65.3	736,638	258,489	218	..	112	33.9
1935	4,295	516,663	533,280	4,599	12,433	61.4	737,730	233,818	225	7	117	33.5
Southern 1936	6,596	1,217,814	1,235,367	21,065	28,135	68.1	1,540,759	601,615	459	33	307	38.4
1935	6,599	1,070,680	1,084,905	17,241	24,231	64.7	1,332,866	485,445	393	91	358	42.5
Northwestern Region:												
Chi. & North Western.....1936	8,355	966,626	1,015,621	25,614	24,432	64.9	1,439,838	561,936	331	134	262	36.0
1935	8,428	848,794	892,701	21,164	21,496	64.3	1,269,413	429,920	394	115	267	43.1
Chicago Great Western....1936	1,458	234,377	234,807	8,116	7,273	64.7	429,615	156,505	57	1	31	34.8
1935	1,456	226,623	226,875	3,517	6,510	58.9	407,135	140,139	60	5	37	36.0
Chi., Milw., St. P. & Pac...1936	11,128	1,272,030	1,351,463	54,685	33,731	61.1	2,127,941	821,901	432	113	140	20.4
1935	11,118	1,135,330	1,195,470	51,343	29,758	60.6	1,831,517	689,855	369	113	198	29.1
Chi., St. P., Minneap. & Om.1936	1,637	200,615	210,533	9,002	4,564	70.3	261,557	104,828	80	35	34	22.8
1935	1,644	187,363	192,856	8,324	3,894	64.6	232,543	86,747	56	56	47	29.6
Great Northern 1936	8,155	703,628	700,499	25,183	22,848	66.2	1,413,156	587,808	350	57	195	32.4
1935	8,041	646,208	652,469	24,700	20,781	65.6	1,284,630	552,170	333	90	182	30.1
Minneap., St. P. & S. St. M.1936	4,273	360,031	366,957	4,146	8,285	70.4	462,640	184,753	117	..	40	25.5
1935	4,274	351,624	356,873	3,194	7,412	64.4	415,631	160,258	117	..	42	26.4
Northern Pacific 1936	6,429	604,481	666,008	45,346	18,609	68.5	1,082,258	444,190	344	21	90	19.8
1935	6,416	561,739	628,084	45,181	18,321	69.4	1,041,856	434,047	353	14	90	19.7
Central Western Region:												
Alton 1936	928	192,773	196,116	1,510	4,318	62.5	273,470	101,012	64	4	30	30.6
1935	921	186,629	188,591	1,494	3,757	54.9	254,664	87,535	67	1	35	34.0
Atch., Top. & S. Fe (incl. 1936	13,235	1,725,183	1,860,081	74,858	46,384	62.8	2,844,458	922,159	553	93	356	35.5
P. & S.F. & G.C. & S.F.)..1935	13,308	1,612,891	1,698,995	62,192	44,724	62.9	2,701,960	861,746	502	135	373	36.9
Chi., Burl. & Quincy.....1936	8,969	1,239,181	1,294,214	40,997	32,603	64.2	1,900,526	787,999	436	1	103	19.1
1935	8,971	1,110,308	1,155,215	41,313	27,409	61.6	1,577,577	621,962	447	11	115	20.1
Chi., Rock I. & Pac. (incl. 1936	8,176	1,155,907	1,172,256	6,698	25,187	63.1	1,511,814	547,466	391	3	324	45.1
Chi., Rock I. & Gulf)...1935	8,272	1,038,665	1,052,973	5,441	22,629	59.8	1,379,302	469,349	366	10	355	48.6
Denver & R. G. Wn.....1936	2,584	285,350	311,522	30,151	7,342	68.2	449,877	184,369	164	10	31	15.1
1935	2,602	216,525	233,765	21,766	5,701	66.8	337,574	136,603	150	18	52	23.6
Southern Pac.-Pac. Lines...1936	8,596	1,302,377	1,416,388	163,265	42,167	62.8	2,626,262	872,916	494	63	235	29.7
1935	8,602	1,157,511	1,253,107	142,464	37,624	60.8	2,393,607	768,242	390	139	267	33.5
Union Pacific† 1936	9,829	1,604,959	1,668,787	101,601	51,517	64.1	3,104,622	1,077,014	557	65	252	28.8
1935	9,832	1,526,162	1,594,704	103,053	47,088	64.2	614,669	212,277	99	25	78	38.6
Southwestern Region:												
Mo.-Kans.-Texas Lines.....1936	3,282	371,343	376,358	5,835	10,284	62.3	2,779,740	975,122	551	91	256	28.5
1935	3,282	340,642	343,251	5,268	9,027	59.2	553,158	181,977	84	26	84	43.3
Missouri Pacific 1936	7,201	1,126,136	1,162,469	25,606	32,513	63.7	2,015,366	740,707	314	81	149	27.4
1935	7,208	1,062,827	1,092,069	23,977	27,282	62.2	1,685,226	609,494	267	117	177	31.6
St. Louis-San Francisco....1936	4,888	680,567	685,294	9,741	14,819	65.3	889,535	359,720	262	104	70	16.1
1935	4,993	632,571	639,381	10,284	13,476	60.6	822,266	311,363	286	126	68	14.2
St. Louis Southw. Lines...1936	1,768	258,318	258,612	3,332	7,168	63.2	420,778	145,707	99	10	9	7.6
1935	1,774	257,510	263,198	3,515	6,488	57.1	403,380	124,056	99	8	12	10.1
Texas & New Orleans.....1936	4,416	546,239	546,343	8,615	12,783	61.6	803,956	284,308	202	34	59	20.0
1935	4,429	527,442	527,951	5,067	11,802	60.0	746,013	251,409	192	57	54	17.8
Texas & Pacific.....1936	1,945	284,269	284,463	2,009	8,688	61.4	531,853	174,614	65	56	98	44.7
1935	1,945	255,356	255,356	1,622	7,438	60.5	458,396	147,635	77	74	69	31.3

NOTE:—Effective with carrier reports for the month of January, 1936, the rules relative to operating statistics of large steam railways were revised with the following effect on this statement: Miles of road operated, number of locomotives on line, and number of freight cars on line were changed from averages for the month to actual figures as of the close of the month. Freight train and locomotive-miles, which formerly applied only to freight trains and the *freight proportion of mixed trains*, based on car-miles, were changed to apply to freight trains and all mixed trains handling more freight-train cars than passenger-train cars. Carriers were not required to rework 1935 figures according to the revised rules, but they have in some cases supplied considerable comparable data. In other cases, the figures shown in this statement for last year were restated by the carriers from last year's reports, or inserted from such reports by the Bureau of Statistics.

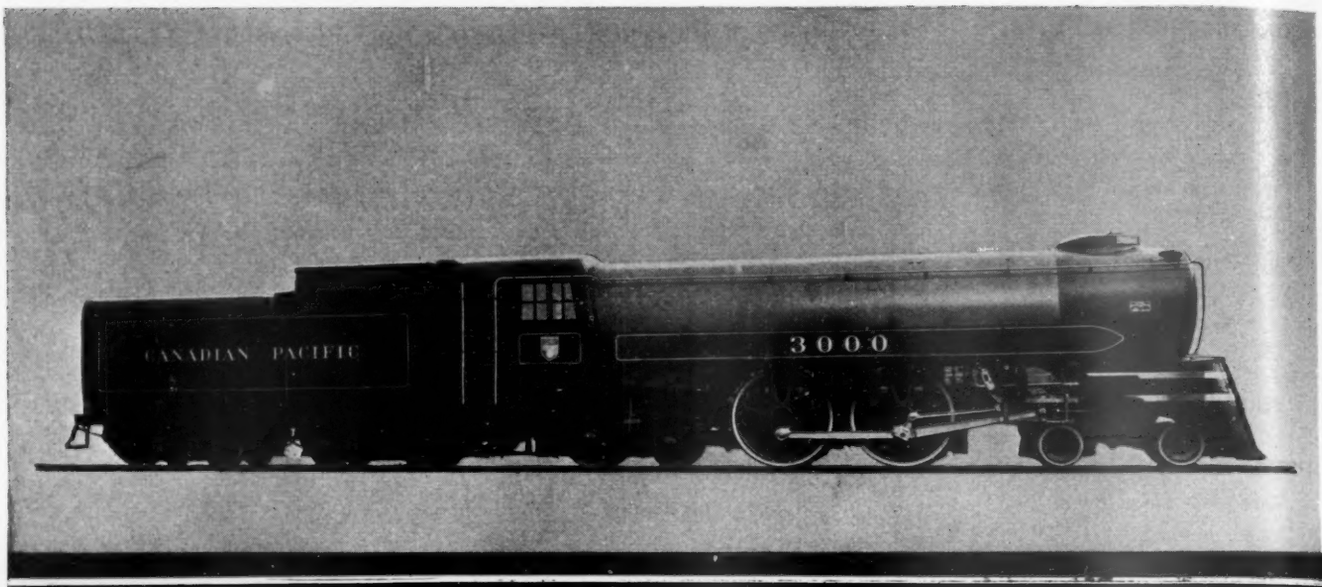
* Not available.

† Includes Los Angeles & Salt Lake, Oregon Short Line, Oregon-Washington R. R. & Navigation Co. and St. Joseph & Grand Island, leased January 1, 1936.

1936, Compared with April, 1935, for Roads with Annual Operating Revenues Above $25,000,000

Region, road, and year	Number of freight cars on line: Home	Foreign	Total	Per cent unserviceable	Gross ton-miles per train-hour, excluding locomotives and tenders	Gross ton-miles per train-mile, excluding locomotives and tenders	Net ton-miles per train-mile	Net ton-miles per loaded car-mile	Net ton-miles per car-day	Car-miles per car-day	Net ton-miles per mile of road per day	Pounds of coal per 1,000 gross ton-miles, including locomotives and tenders	Locomotive-miles per locomotive-day
New England Region:													
Boston & Albany.....1936	2,349	4,711	7,060	21.9	21,616	1,304	446	18.2	278	22.8	5,385	157	54.4
1935	2,921	4,181	7,102	24.0	21,544	1,301	455	18.4	259	20.5	4,702	155	48.1
Boston & Maine.....1936	8,165	8,173	16,338	14.8	23,144	1,903	681	20.0	346	26.1	3,325	110	42.4
1935	8,679	7,765	16,444	14.3	25,797	1,845	669	19.8	384	28.6	3,063	107	39.3
N. Y., New H. & Hartf...1936	13,083	12,624	25,707	16.2	26,035	1,888	683	19.7	298	22.9	3,845	107	52.7
1935	15,611	11,094	26,705	14.2	26,040	1,857	668	19.8	276	21.5	3,601	107	47.2
Great Lakes Region:													
Delaware & Hudson.....1936	8,385	3,781	12,166	5.3	29,884	2,201	1,020	28.5	571	30.9	8,635	110	38.5
1935	11,387	2,757	14,144	5.0	30,010	2,195	996	28.6	455	26.0	8,065	115	38.2
Del., Lack. & Western.....1936	13,321	6,834	20,155	16.0	31,601	1,951	768	23.4	479	30.9	9,895	131	66.7
1935	16,730	4,576	21,306	12.6	31,806	1,924	752	24.1	400	26.0	8,615	135	56.0
Erie (incl. Chi. & Erie)...1936	17,469	18,234	35,703	4.5	41,858	2,511	945	22.3	633	43.1	9,206	101	51.9
1935	23,757	11,550	35,307	6.8	41,012	2,483	915	21.8	518	36.8	8,154	98	47.5
Grand Trunk Western.....1936	3,863	8,355	12,218	13.3	31,863	1,669	582	20.7	453	34.4	5,142	103	68.0
1935	4,208	7,816	12,024	17.9	31,931	1,651	535	19.4	352	30.0	4,286	102	58.0
Lehigh Valley 1936	11,811	10,242	22,053	8.0	36,469	2,072	834	24.5	503	31.3	8,031	122	50.6
1935	14,056	4,543	18,599	8.9	34,584	1,984	801	25.4	516	31.9	7,359	133	47.5
New York Central.....1936	105,796	72,080	177,876	18.4	35,860	2,156	860	25.5	448	29.3	7,190	108	67.2
1935	*	*	109,435	22.4	35,222	2,082	803	24.0	365	24.1	5,544	103	53.4
New York, Chi. & St. L....1936	6,278	7,672	13,950	3.6	37,341	2,082	774	22.0	880	63.4	7,241	92	83.5
1935	8,679	5,552	14,231	4.6	36,188	1,968	701	21.1	644	49.0	5,862	94	74.1
Pere Marquette 1936	8,547	7,504	16,051	4.8	28,107	1,692	610	23.0	502	35.2	3,743	96	86.8
1935	11,025	5,325	16,350	4.2	27,087	1,609	573	22.6	402	29.6	3,171	98	80.2
Pitts. & Lake Erie.....1936	13,595	11,370	24,965	41.8	41,805	3,124	1,697	45.7	167	6.2	18,169	106	37.4
1935	15,760	9,512	25,272	39.1	41,909	2,940	1,518	42.9	114	4.9	11,855	118	27.0
Wabash 1936	10,007	9,311	19,318	3.0	36,176	1,802	602	19.6	596	47.9	4,719	113	64.6
1935	12,276	8,058	20,334	4.9	36,866	1,807	567	18.4	492	44.1	4,245	115	57.4
Central Eastern Region:													
Baltimore & Ohio.....1936	68,213	27,610	95,823	15.6	26,483	2,057	930	29.8	450	23.3	6,780	146	48.8
1935	77,116	21,241	98,357	17.7	25,775	1,897	795	27.6	331	19.7	5,144	150	41.4
Central of New Jersey.....1936	11,045	11,134	22,179	30.1	27,613	2,395	1,152	32.4	267	13.2	8,152	142	43.3
1935	12,800	7,954	20,754	28.0	29,672	2,441	1,156	32.9	251	13.0	7,551	143	38.8
Chicago & Eastern Ill.....1936	3,246	3,184	6,430	10.6	27,079	1,482	621	25.3	551	32.6	3,802	132	53.6
1935	3,573	2,439	6,012	8.3	26,846	1,487	579	25.0	479	32.0	3,075	131	47.3
Elgin, Joliet & Eastern....1936	8,205	4,658	12,863	5.5	17,673	2,044	1,021	37.6	251	10.6	7,273	121	37.7
1935	8,014	2,828	10,842	8.9	17,223	1,818	878	37.3	224	10.2	5,579	123	34.4
Long Island 1936	626	3,553	4,179	2.0	5,951	809	303	28.9	66	4.5	700	314	29.4
1935	779	3,411	4,190	3.2	5,872	792	327	31.8	86	5.1	887	295	29.3
Pennsylvania System 1936	200,293	66,655	266,948	16.3	32,266	2,387	1,046	29.6	372	20.3	10,154	121	51.9
1935	237,947	44,747	282,694	14.8	32,552	2,255	945	27.5	271	16.0	7,648	123	41.3
Reading 1936	25,178	11,624	36,802	10.3	24,504	2,042	976	33.9	342	16.2	9,249	146	48.5
1935	32,055	8,391	40,446	7.4	25,503	2,005	933	33.2	277	14.1	7,945	156	41.1
Pocahontas Region:													
Chesapeake & Ohio.....1936	41,946	14,588	56,534	1.7	51,356	3,702	2,022	44.6	937	35.8	17,024	79	53.7
1935	45,066	9,434	54,500	2.0	48,449	3,416	1,770	43.5	771	32.7	13,740	80	46.0
Norfolk & Western.....1936	27,985	6,054	34,039	2.0	48,118	3,343	1,792	43.2	980	37.0	16,830	105	60.1
1935	33,072	4,032	37,104	2.5	44,130	2,975	1,485	39.3	702	30.3	12,096	112	50.8
Southern Region:													
Atlantic Coast Line.....1936	19,941	8,926	28,867	21.2	20,578	1,183	394	18.4	274	24.6	1,581	114	50.7
1935	23,327	6,368	29,695	24.7	20,298	1,147	368	17.6	234	22.6	1,437	116	46.5
Central of Georgia.....1936	3,787	2,843	6,630	7.1	21,599	1,182	457	21.0	554	36.5	1,949	123	66.6
1935	6,529	2,095	8,624	25.9	22,150	1,212	458	20.7	399	28.2	1,823	129	54.3
Illinois Central (incl. 1936	37,937	19,501	57,438	30.1	25,365	1,480	599	25.1	512	31.4	4,499	136	58.9
Y. & M. V.).....1935	44,450	15,348	59,798	33.9	25,611	1,472	570	24.4	436	29.3	3,867	136	49.7
Louisville & Nashville.....1936	35,895	11,589	47,484	23.1	24,720	1,642	773	32.9	557	27.9	5,365	133	68.1
1935	46,532	8,698	55,230	29.6	23,536	1,483	661	31.1	381	21.2	3,967	146	57.9
Seaboard Air Line.....1936	9,751	5,945	15,696	2.5	23,839	1,453	510	20.1	538	40.8	2,006	121	54.2
1935	11,397	5,099	16,496	3.9	24,022	1,454	461	18.8	465	40.2	1,815	119	51.7
Southern 1936	22,964	17,986	40,950	14.3	20,527	1,275	498	21.4	487	33.4	3,040	149	52.4
1935	27,515	15,358	42,873	15.1	20,859	1,250	455	20.0	377	29.1	2,452	150	43.6
Northwestern Region:													
Chi. & North Western.....1936	36,834	19,155	55,989	8.9	23,391	1,492	582	23.0	328	22.0	2,242	131	46.7
1935	40,676	18,802	59,478	8.4	22,784	1,500	508	20.0	239	18.6	1,700	133	39.3
Chicago Great Western....1936	1,899	3,948	5,847	2.3	30,992	1,834	668	21.5	951	68.3	3,578	133	91.0
1935	2,405	2,688	5,093	4.4	33,462	1,800	619	21.5	891	70.2	3,208	130	75.7
Chi., Milw., St. P. & Pac...1936	42,389	18,758	61,147	3.1	26,734	1,679	648	24.4	445	29.9	2,462	125	67.8
1935	50,881	14,622	65,503	2.9	25,711	1,619	610	23.2	351	25.0	2,068	127	61.1
Chi., St. P., Minneap. & Om.1936	3,218	5,020	8,238	8.7	17,504	1,306	523	23.0	422	26.1	2,135	123	50.1
1935	1,963	6,355	8,318	11.2	18,274	1,241	463	22.3	338	23.5	1,759	123	41.9
Great Northern 1936	37,469	9,583	47,052	10.8	30,017	2,021	841	25.7	408	23.9	2,403	125	40.3
1935	41,506	8,408	49,914	9.6	29,972	2,000	860	26.6	362	20.8	2,289	131	37.3
Minneap., St. P. & S. St. M.1936	11,839	4,565	16,404	5.6	20,613	1,291	516	22.3	377	24.0	1,441	109	78.3
1935	13,834	3,172	17,006	5.2	18,739	1,186	457	21.6	316	22.7	1,250	115	77.4
Northern Pacific 1936	27,892	5,291	33,183	12.3	28,109	1,798	738	23.9	442	27.0	2,303	151	52.6
1935	33,740	4,334	38,074	12.2	28,587	1,868	778	23.7	376	22.9	2,255	154	49.2
Central Western Region:													
Alton 1936	2,336	5,744	8,080	25.6	33,008	1,423	525	23.4	399	27.3	3,627	124	65.9
1935	3,288	6,159	9,447	27.4	31,409	1,368	470	23.3	313	24.5	3,167	129	59.8
Atch., Top. & S. Fe (incl. 1936	66,017	13,420	79,437	12.4	31,225	1,653	536	19.9	388	31.2	2,323	126	65.0
P. & S.F. & G.C. & S.F.)..1935	74,661	10,342	85,003	13.0	31,640	1,680	536	19.3	337	27.8	2,158	124	58.1
Chi., Burl. & Quincy.....1936	26,592	14,239	40,831	10.3	27,065	1,540	638	24.2	625	40.3	2,929	127	82.1
1935	33,111	12,038	45,149	9.1	25,529	1,426	562	22.7	457	32.7	2,311	131	69.6
Chi., Rock I. & Pac. (incl. 1936	24,516	12,385	36,901	10.9	23,522	1,312	475	21.7	492	35.9	2,232	142	54.7
Chi., Rock I. & Gulf)...1935	30,828	10,414	41,242	22.7	23,159	1,330	453	20.7	372	30.0	1,891	142	48.3
Denver & R. G. Wn.....1936	12,896	2,987	15,883	7.5	25,659	1,582	648	25.1	383	22.4	2,378	159	54.5
1935	13,348	2,543	15,891	5.9	24,736	1,565	633	24.0	292	18.3	1,750	161	38.9
Southern Pac.-Pac. Lines...1936	33,214	23,534	56,748	9.1	32,778	2,035	677	20.7	513	39.5	3,385	106	67.0
1935	34,615	24,492	59,107	8.6	33,511	2,080	668	20.4	430	34.8	2,977	105	57.9
Union Pacific† 1936	40,308	17,356	57,664	14.4	39,628	1,946	675	20.9	629	46.9	3,653	123	67.3
1935	44,873	15,307	60,180	18.2	37,636	1,833	643	20.7	591	46.8	3,306	119	63.3
Southwestern Region:													
Mo.-Kans.-Texas Lines.....1936	4,657	5,477	10,134	3.4	31,160	1,658	572	20.6	698	54.3	2,156	91	63.1
1935	5,709	3,110	8,819	3.4	29,690	1,627	535	20.2	688	57.6	1,848	89	60.1
Missouri Pacific 1936	14,796	19,815	34,611	3.9	32,314	1,795	660	22.8	723	49.8	3,429	120	72.4
1935	19,484	15,980	35,464	3.6	27,773	1,593	576	22.3	567	40.8	2,819	128	66.4
St. Louis-San Francisco....1936	18,738	6,589	25,327	7.1	24,934	1,311	530	24.3	473	29.9	2,453	135	53.1
1935	21,969	4,929	26,898	7.0	23,783	1,303	493	23.1	386	27.6	2,079	137	45.1
St. Louis Southw. Lines...1936	2,842	2,639	5,481	5.3	30,790	1,632	565	20.3	848	66.0	2,748	96	74.0
1935	3,664	3,104	6,768	7.7	29,704	1,568	482	19.1	622	57.0	2,332	93	74.1
Texas & New Orleans.....1936	7,129	11,984	19,113	7.8	26,597	1,481	524	22.2	487	35.5	2,143	89	62.5
1935	7,580	10,645	18,225	8.9	26,415	1,423	480	21.3	463	36.2	1,889	90	58.3
Texas & Pacific.....1936	2,459	5,576	8,035	3.6	30,827	1,877	616	20.1	744	60.3	2,992	90	43.6
1935	2,884	4,354	7,238	5.6	29,343	1,801	580	19.8	697	58.1	2,530	88	38.9

Compiled by the Bureau of Statistics, Interstate Commerce Commission. Subject to revision.



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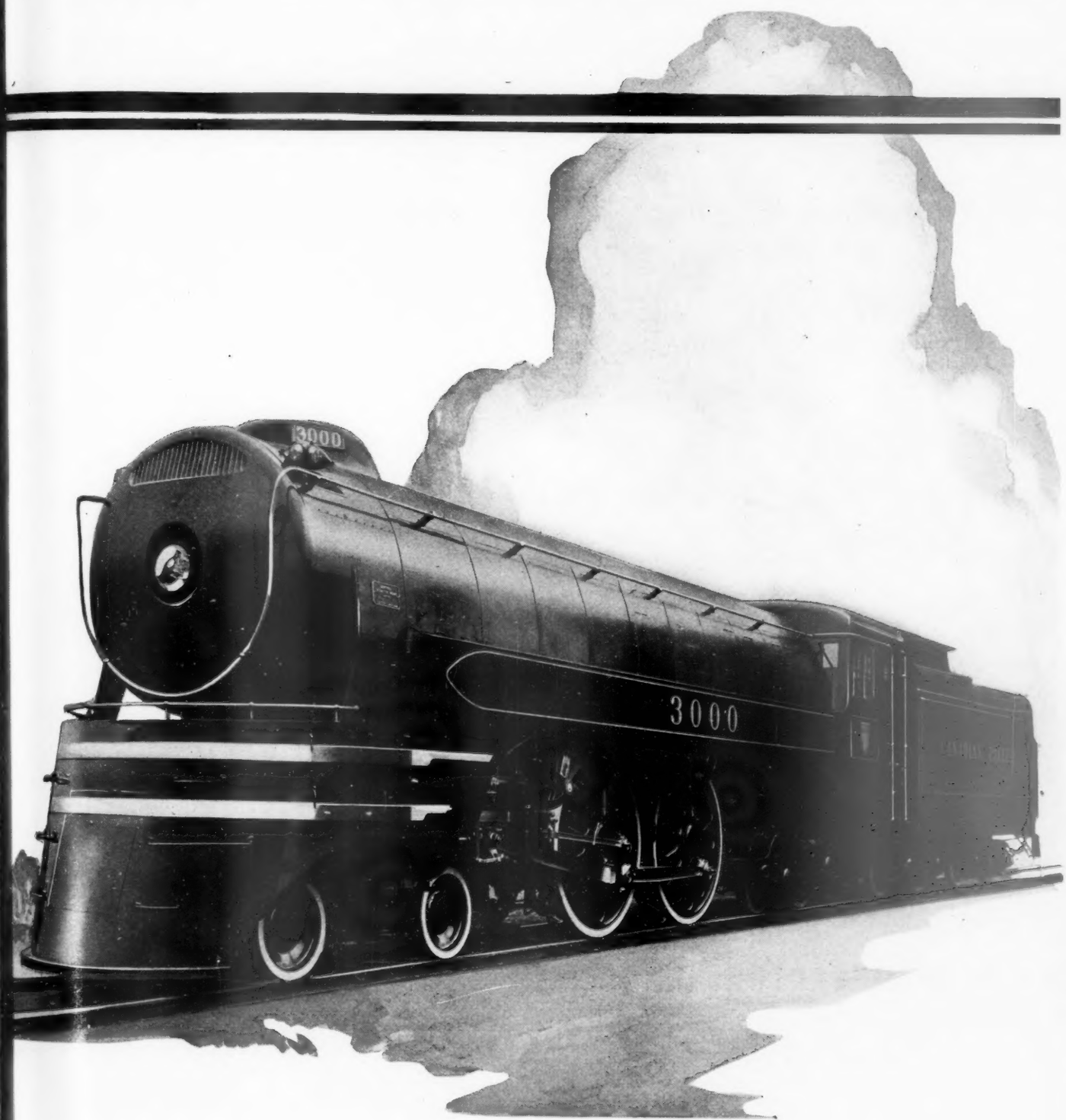
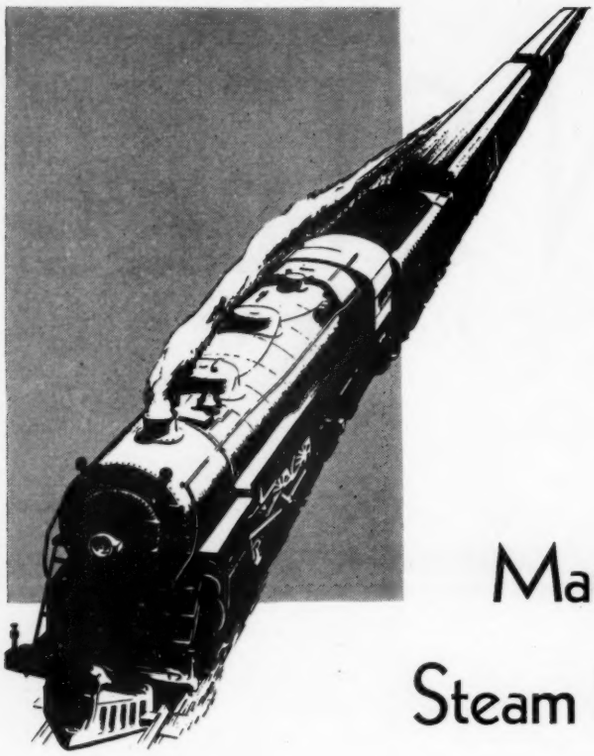
THE "JUBILEE" TYPE





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